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NEW AND LITTLE-KNOWN SPECIES OF AFRICAN TRICHOPTERA

D. E. KIMMINS

BULLETIN OF
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ENTOMOLOGY Vol. 6 No. 1
LONDON: 1957

NEW AND LITTLE-KNOWN SPECIES OF AFRICAN TRICHOPTERA

BY

D. E. KIMMINS xuf.

Pp. 1–37 ; 27 *Text-figures*

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NEW AND LITTLE-KNOWN SPECIES OF AFRICAN TRICHOPTERA

By D. E. KIMMINS

Department of Entomology, British Museum (Nat. Hist.)

THIS paper is based on collections made in East Africa by Dr. N. E. Hickin in 1954 and 1956 and by Dr. P. S. Corbet, 1954–56 ; in Ghana (Gold Coast) by Professor Lewis Berner in 1950 and upon other small collections made by Mr. Elliot Pinhey and Mr. C. N. Smithers. It includes new species in the families Philopotamidae, Polycentropodidae, Hydropsychidae, Hydroptilidae, Leptoceridae and Lepidostomatidae, in all, seventeen new species. The types of all new species have been presented to the British Museum (Nat. Hist.) by the captors, to whom the author wishes to express his thanks for the opportunity of studying this interesting material.

Family PHILOPOTAMIDAE

Chimarra cognata sp. n.

(Text-figs. 1–2)

RHODESIA. Victoria Falls, i.1956, numerous examples, (*E. Pinhey*).

♂ (in alcohol). General colour ochraceous or very pale fuscous. Antennae and palpi pale fuscous. Legs ochraceous. Spurs fuscous, 1.4.4, those of the anterior leg short. Abdomen ochraceous, apex of aedeagus and inturned claws of claspers piceous. Wings pale fuscous, venation much as in *C. intexta* Mosely. (It should be noted that the original figure of the anterior wing of *C. intexta* is incorrect, Cu_{1a} being accidentally omitted. A corrected figure will be found in Mosely, 1936, *Ann. Mag. n. H.*, (10) **17** : 446, fig. 35.)

♂ GENITALIA. Ninth and tenth segments fused dorsally, ninth sternite with a small, acute process. Tenth segment with two sclerotized lateral lobes, from above sinuous and divergent, from the side slightly down-curved, apices dark brown. Cercus rounded in side view, arising from a thin, plate-like lobe which extends beneath the aedeagus. The latter has a slender stem, and towards the apex on each side is a spatulate, sclerotized lobe, which has a piceous tip. Apex of aedeagus membranous and carrying two fuscous, claw-like spines. Claspers broad, moderately long ; from the side the upper margin is elevated about mid-way in a strong claw, directed inwards across the clasper. There is a second acute process arising from the inner surface, mid-way between the incurved claw and the apex.

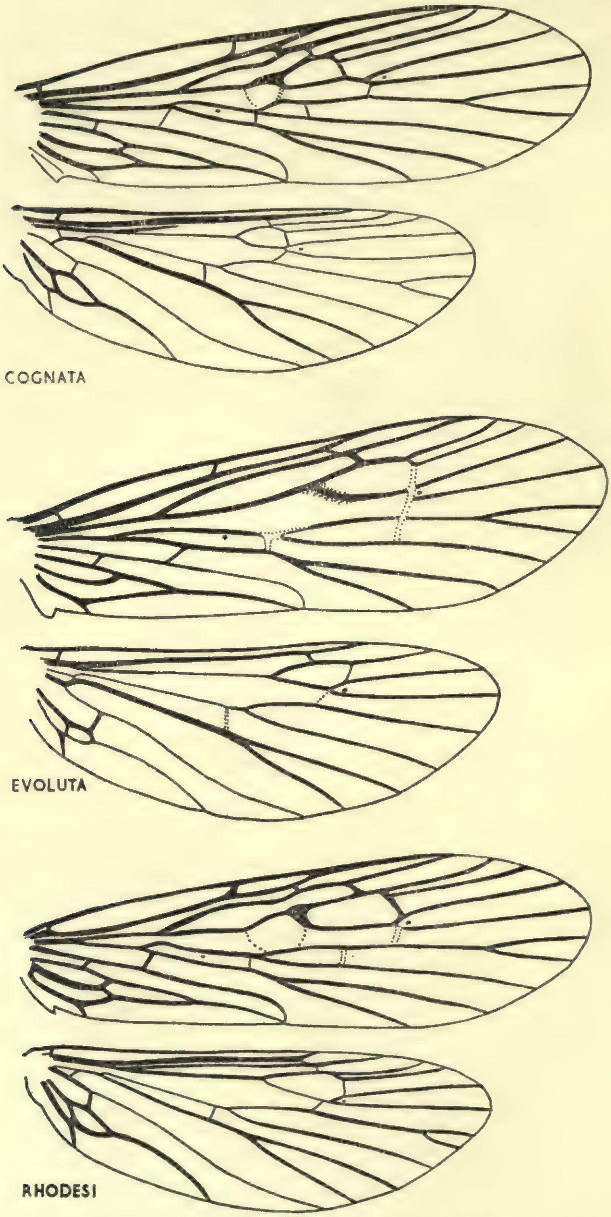

Fig. 1. Wings of *Chimarra cognata*, sp. n., *C. evoluta* sp. n., and *C. rhodesi* sp. n.

♀ genitalia. Seventh sternite with a small ventral process. Eighth segment forming an almost complete ring, its dorsal surface membranous. Apical margins darkly pigmented, from the side with a median, hyaline area simulating an excision. Subgenital plate triangular from the side, about as long as eighth segment. From beneath its lateral margins are convex. Ninth tergite short, saddle-shaped, with two long, basal apodemes.

Length of fore wing, 5 mm.

♂ holotype mounted as microscope preparations, ♀ allotype with abdomen mounted as microscope preparation. Paratypes in British Museum (Nat. Hist.) and National Museum of S. Rhodesia, Bulawayo. This species is closely related to *C. intexta* Mosely from Sierra Leone, as is obvious from a comparison of the ♂ claspers and the wing venation. The general resemblance in ♂ genitalia may well be greater than appears on comparing the figures of the two species. Mosely, in describing *intexta*, states that one superior appendage (lateral lobe of tenth segment) has been broken off in the unique type. I have examined this specimen and I suspect that not only has the tenth segment been rather extensively damaged but the apical part of the aedeagus also appears to be missing. When *C. intexta* is re-discovered, it is possible that *cognata* may prove to be a subspecies of it. For the present, the chief differences in *cognata* are the narrower base of the incurved claw and acute apex of the clasper in side view and the shorter, broader clasper in ventral view.

Chimarra evoluta sp. n.

(Text-figs. 1, 3)

S. RHODESIA. Salisbury Experimental Station, light trap, 1, 3.x.1956, 2 ♂, 5 ♀ (*C. N. Smithers*).

♂ (in alcohol). Head piceous or very dark fuscous, warts and front of head a little paler, and with sparse piceous hairs. Antennae and palpi dark fuscous. Thorax fuscous, with paler warts. Legs fuscous, posterior femur with a paler median ring. Spurs 1.4.4. Abdomen pale fuscous, genitalia piceous. Anastomosis in fore wing straight, whitish hyaline. In hind wing, venation somewhat reduced, R_1 obsolete or fused with Sc, which is a strong vein, veins R_{2+3} and M_{1+2} each unforked (i.e., cells R_2 and M_1 are lacking).

♂ GENITALIA. Ninth segment membranous above, the upper lateral margins each produced caudad in a long, slender spine running alongside the aedeagus. Ventral surface of ninth segment with a small median keel towards the base. Cerci short and moderately broad. Tenth segment forming a pair of stout spines, connected at their bases, situated above and at the side of the aedeagus. The basal half of each spine is produced upwards and outwards in a thin foliate plate, appearing as a lobe in dorsal view, with the spine projecting beyond it. Aedeagus long, slender, lightly sclerotized. Clasper large, in side view somewhat reniform, with its upper basal margin produced upwards and inwards in a broad, thin lobe, fringed with setae. From beneath, the clasper is elongate, with an incurved, tapering, truncate apex. At the base on the inner surface is a slender finger.

♀ (in alcohol). Resembling the male, but slightly larger and darker. Abdomen pale fuscous, terminal segments darker. Venation as in male.

♀ GENITALIA. Seventh segment with a small ventral process. Eighth segment forming a complete ring, although the lateral margins are somewhat excised. Its dorsal, apical margin is excised at the centre, the excision continuing basally as a narrow, median, semi-membranous groove. Ventral apical margin produced in a subgenital plate, covering the membranous ninth sternite. From beneath, this plate has a narrow, median, membranous groove running from near the base to the excised apex. Ninth tergite saddle-shaped, from above tapering from mid-way to a bilobed apex. Tenth segment with a pair of semi-membranous processes each carrying a small cercus. Bursa copulatrix very lightly sclerotized and obscure.

Length of fore wing ♂, 5 mm., ♀, 5·5 mm.

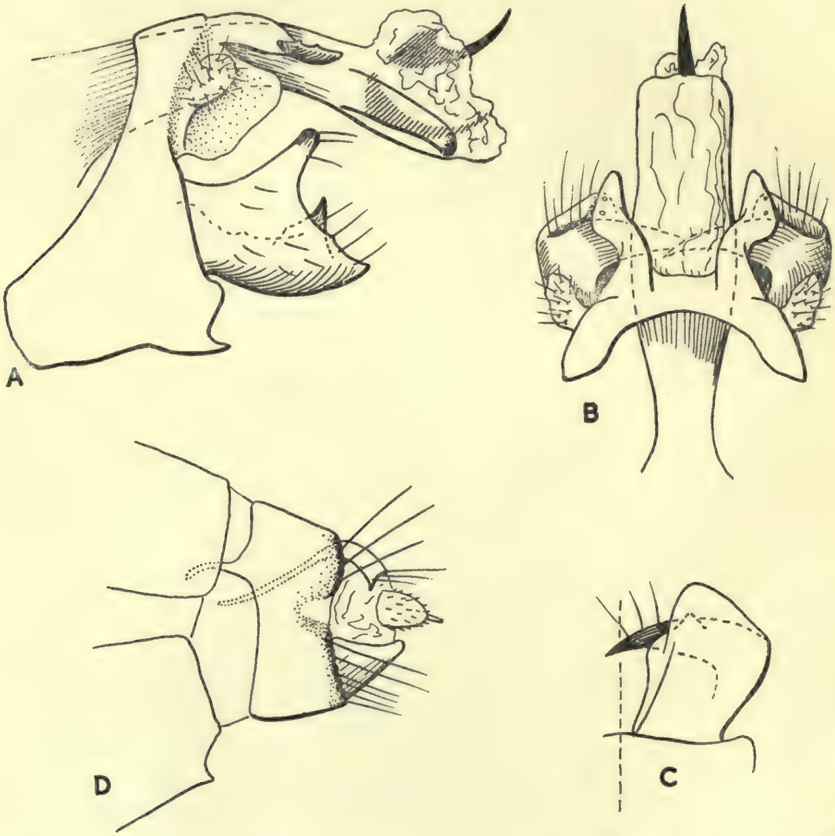

Fig. 2. *Chimarra cognata* sp. n. Genitalia. (A), ♂, lateral; (B), ♂, dorsal; (C), ♂, right clasper, ventral; (D), ♀, lateral.

♂ holotype (3. x.) mounted as microscope preparations, ♀ allotype (3. x.) in 2% formaldehyde solution, abdomen mounted as microscope preparation. Paratypes in British Museum (Nat. Hist.) and Dept. of Research and Specialist Services, Salisbury, S. Rhodesia. *C. evoluta* (and another closely allied species being published in the *Ruwenzori Expedition Reports*, II) are related to *C. georgensis* Barnard in the obsolete R_1 in the hind wing and the straight, white anastomosis in the fore wing.

They both differ from Barnard's species in male genitalia, the complete absence of R_1 and the unforked condition of R_{2+3} and M_{1+2} in the hind wing. *C. evoluta* differs from the allied East African species in the longer and more slender spines arising from the ninth segment, the less produced lower lateral margins of the ninth segment and the relatively larger, more elongate claspers.

I was at first disposed to place this species and the East African one in Lestage's genus *Chimarrhafra* (type species, *C. georgensis* Barnard). Lestage's chief character, the obsolescence of R_1 in the hind wing, is however not restricted to species from Africa, but occurs also in examples from Fiji, Solomons and Sarawak. The present species carries the reduction of the wing venation two stages further in the hind wing, in the unforked condition of R_{2+3} and M_{1+2}. R_{2+3} also occurs in the hind wing in other species of *Chimarra* (e.g., Australian spp.), but this reduction is not necessarily correlated with reduction of R_1. I am therefore in agreement with Ross (1956) that *Chimarrhafra* Lestage should be synonymized with *Chimarra*.

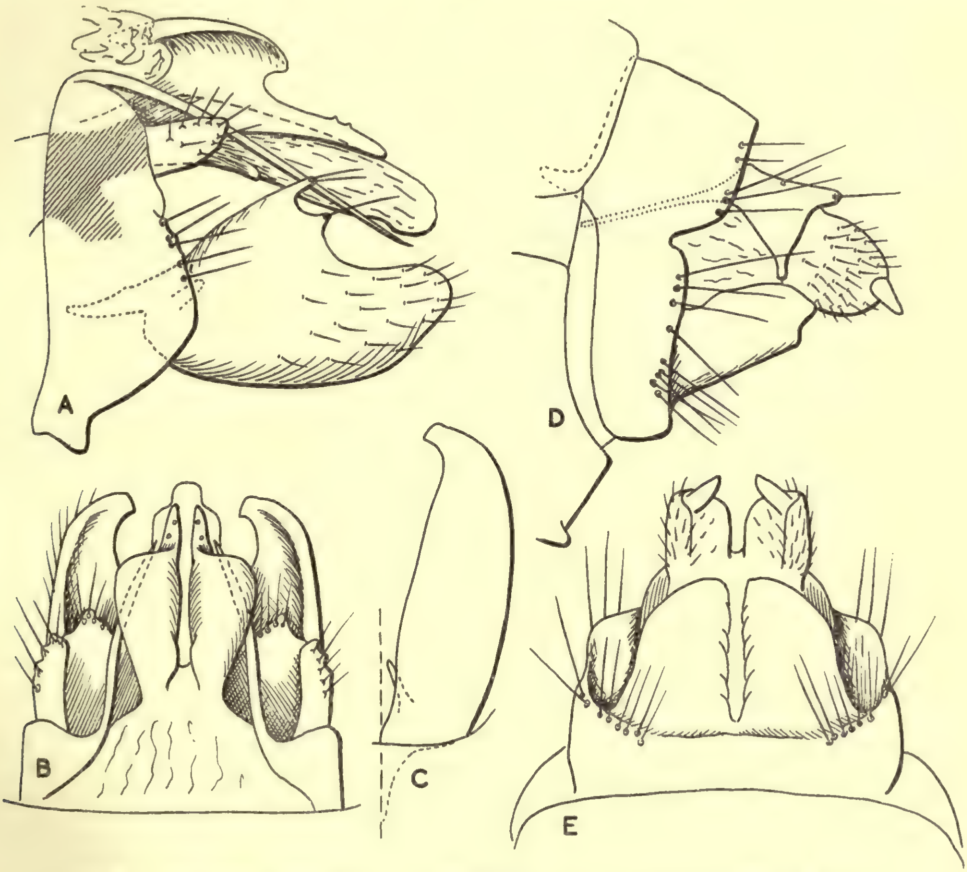

FIG. 3. *Chimarra evoluta* sp. n. Genitalia. (A), ♂, lateral; (B), ♂, dorsal; (C), ♂, right clasper, ventral; (D), ♀, lateral; (E), ♀, ventral.

Chimarra rhodesi sp. n.

(Text-figs. 1, 4)

S. Rhodesia. Salisbury Experimental Station, light trap, 3–4.x.1956, 3 ♂, (*C. N. Smithers*).

♂ (in alcohol). Head fuscous, occipital warts pale, antennae and palpi fuscous. Thorax fuscous, warts pale. Legs pale fuscous, femora paler than tibiae. Spurs 1.4.4. Abdomen ochraceous, with fuscous genitalia. Wings medium fuscous, with sparse fuscous pubescence. Shape more elongate than in *evoluta*, venation of the typical *Chimarra* pattern.

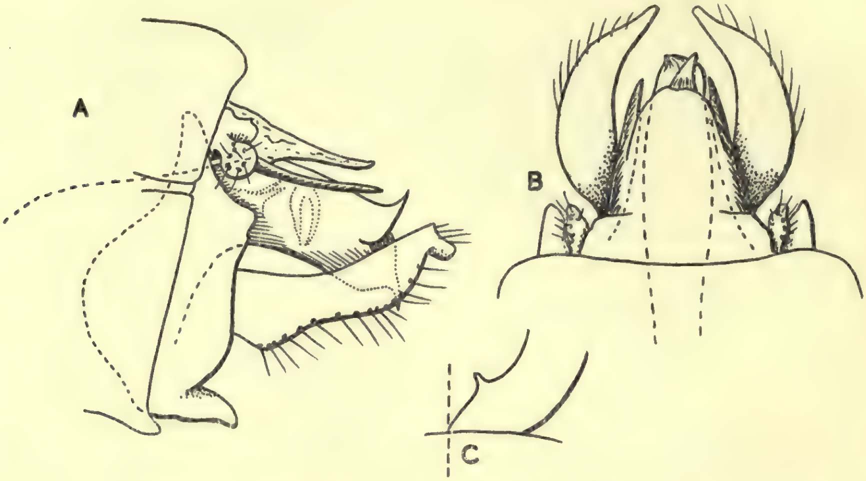

Fig. 4. *Chimarra rhodesi* sp. n. ♂ Genitalia. (A), lateral; (B), dorsal; (C), base of right clasper, ventral.

♂ genitalia. Eighth segment rather more sclerotized than basal segments, sternite with a small ventral process. Ninth segment more or less membranous dorsally, with a strong, short ventral process. Tenth segment with the median lobe membranous, lateral lobes blackish, spiniform, their bases attached to the ninth segment. Cercus short, rounded, arising from a thin, plate-like base. Aedeagus terminating in two hooks, the dorsal one directed upwards, the ventral downwards. Within the aedeagus can be seen two pairs of small, slender, curved spines. Clasper robust, in side view somewhat constricted about mid-way, apex tapering to an angled finger. From above, the clasper is incurved, stout, tapering to the apex, a small inner projection near the base.

Length of fore wing, 5 mm.

♂ holotype mounted as microscope preparations. Paratypes in British Museum (Nat. Hist.) and in Dept. of Research and Specialist Services, Salisbury, S. Rhodesia. This species is not closely related to any African *Chimarra* known to me. It perhaps comes nearest to *C. elga* Mosely. Both have processes to the eighth and ninth sternites and the claspers are somewhat similar in shape. The clasper in *rhodesi* is more abruptly angled at the apex and more constricted mid-way. The lateral spiniform lobes of the tenth segment are straight, not upcurved, and the armature of the aedeagus is different. Moreover the head and thorax of *C. elga* are orange.

Family POLYCENTROPODIDAE

Nyctiophylax africanus sp. n.

(Text-fig. 5)

UGANDA. Jinja, at light, ix–x.1954, 1 ♂, 3 ♀ (*P. S. Corbet*).

♂ (in alcohol). Head pale fuscous, with fuscous pubescence. Antennae ochraceous, finely annulated with fuscous. Palpi ochraceous. Thorax fuscous above, ochraceous beneath, legs ochraceous with fine fuscous pubescence. Wings brownish, with dense fuscous pubescence. Venation much as in *N. orientalis* Marlier, cell M_3 in the fore wing and cell R_4 in the hind wing sessile. Abdomen reddish ochraceous.

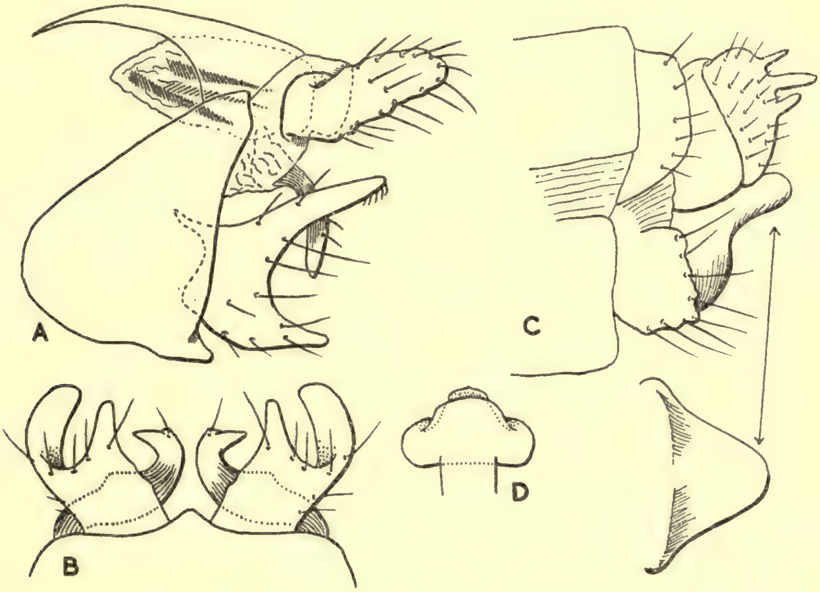

FIG. 5. *Nyctiophylax africanus* sp. n. Genitalia. (A), ♂, lateral; (B), ♂, claspers and hooks of tenth segment, ventral; (C), ♀, lateral, and apex of subgenital plate, ventral; (D), ♀, bursa copulatrix, ventral.

♂ GENITALIA. Eighth tergite overlapping the ninth and tenth, the centre of its apical margin produced in a small rounded lobe. Upper part of ninth segment either membranous or fused with tenth, the centre of the ventral margin produced in a small triangular process. Tenth segment represented by a pair of lightly chitinized plates bearing the cerci, the lower angles of the plates produced downwards and outwards in strong hooks, lying beneath the aedeagus. Cerci moderately elongate, fringed. Aedeagus with its dorsal surface lightly sclerotized, forming a saddle-shaped structure covering a mass of membrane within which are enclosed three pairs of straight spines. Clasper widely excised at its apex, from the side appearing as two divergent branches. From beneath, the upper branch curls inward, broad and spatulate, the lower branch slender acute.

♀ GENITALIA. Eighth sternite with a pair of quadrate lobes, their margins fringed with setae. Subgenital plate roughly triangular in ventral view, sides slightly sinuous, apex rounded ; in side view it is deep at its base, then narrowed to a digitate apex, which reaches almost to apex of abdomen. Bursa copulatrix as shown. Tenth segment with three pairs of short finger-like processes.

Length of fore wing, 4 mm.

♂ holotype, ♀ allotype in 2% formaldehyde solution, one pair of ♂ wings, ♂ and ♀ abdomens mounted as microscope preparations. This species differs from both *N. occidentalis* Ulmer and *N. orientalis* Marlier in the deeply bifid clasper of the male and from the former also in the spines of the tenth segment being stouter and downcurved.

Dipseudopsis capensis Walker

KENYA. Nzoia R., Lwamba Ferry, 19–20.iv.1956, 1 ♂ (*P. S. Corbet*).

TANGANYIKA. L. Victoria, Mwanza Pier, 11–13.viii.1956, 36 ♂, 4 ♀ (*P. S. Corbet*).

Widely distributed in Africa.

Dipseudopsis noricis Mosely

GOLD COAST. Volta R., Senchi, 31.vii–2.viii.1950, 19 ♂, 20 ♀ ; Yeji, 14.x.1950, 2 ♂, 1 ♀ (*L. Berner*). Dayi R., Kpandu-Hohoe Rd.,17.viii.1950, 1 ♂ (*L. Berner*). Previous distribution. Gold Coast.

Dipseudopsis njalana Ulmer

GOLD COAST. Afram R., Mankrong, 13.ix.1950, 1 ♂ (*L. Berner*).

Previous distribution. Sierra Leone.

Family HYDROPSYCHIDAE

Subfamily Hydropsychinae

Cheumatopsyche falcifera Ulmer

(Text-fig. 6)

UGANDA. Jinja, at light, 31.xii.1955–24.v.1956, 6 ♂ (*P. S. Corbet*).

I was at first inclined to label these specimens as *C. natalensis* (Barnard) but as they also showed some resemblance to Ulmer's figures of *falcifera* I made a genitalia preparation of the example labelled *type* in our collection. To my surprise it proved to be much nearer the Uganda examples than the figures (made from a dried example) suggested. The tenth segment from the side is more tapered and the terminal

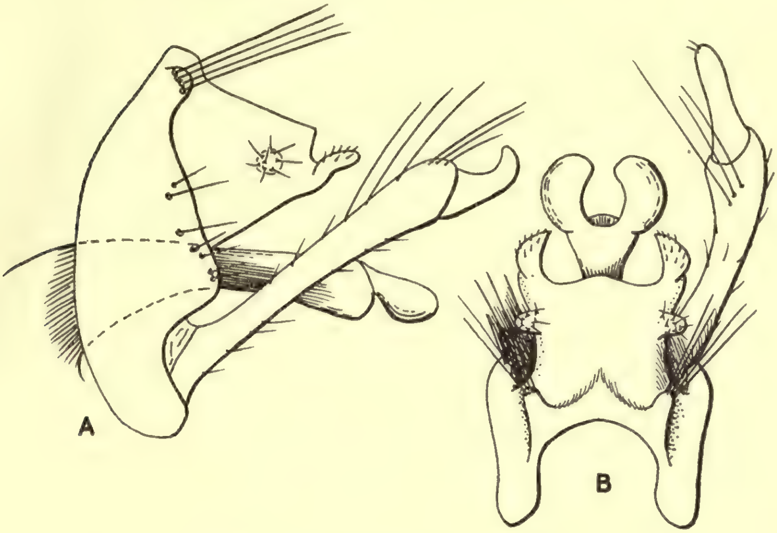

FIG. 6. *Cheumatopsyche falcifera* (Ulmer), ♂ Type. Genitalia. (A), lateral and (B), dorsal.

processes do not turn up so much. There is also a setiferous wart on each side. I am taking this opportunity of re-figuring the genitalia of *falcifera*. The specimen figured is one of three males listed from the Akaki Ravine, and Ulmer states that the type is one of these three. I therefore designate the specimen now figured (abdomen in small tube of glycerine) as the male *Lectotype*. *C. natalensis* (Barnard) now seems even more closely related to *C. falcifera* (Ulmer) and it must be left to South African entomologists to re-examine the type and decide whether it is truly distinct.

Cheumatopsyche uncata sp. n.

(Text-fig. 7)

UGANDA. Albert Nile, Pakwach, 29.iv.1956, 3 ♂, 4 ♀ (*P. S. Corbet*).

(In alcohol). General colour ochraceous, wings denuded.

♂ GENITALIA. Ninth tergite with apical margin produced in two small, rounded lobes. Tenth segment from the side triangular, upper margin gently convex. Near the apex on each side is an upwardly and basally directed acute hook, and basad of it is a low, setiferous wart. From above, the tenth segment is subquadrate, its apical margin produced centrally in a triangle with rounded apex. Sides of the tenth segment a little convex, apical hooks not conspicuous. Aedeagus terminating in a pair of incurved, convex lobes. Basal segment of clasper slender at its base, dilating to a clavate apex. Terminal segment short and triangular from the side, tapering more gradually to a rounded apex in dorsal view.

♀ GENITALIA. Eighth sternite divided medially into two sclerites, ventro-caudal angles forming a wide convex sweep. Clasper-receptacle small, circular, ventro-

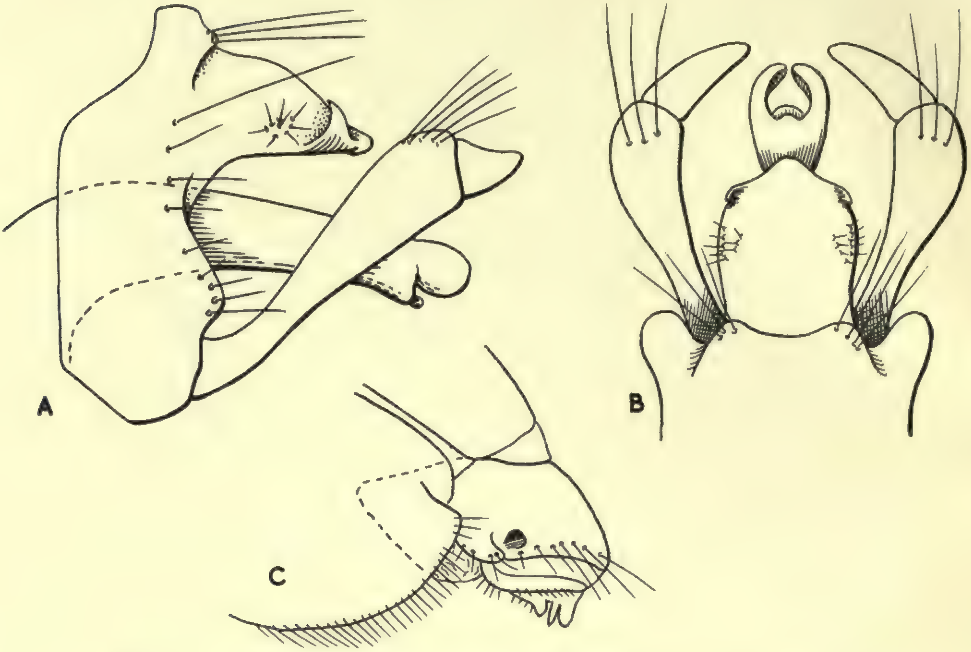

FIG. 7. *Cheumatopsyche uncata* sp. n. Genitalia. (A), ♂, lateral; (B), ♂, dorsal; (C), ♀, lateral.

caudal angle of ninth tergite produced in a small upcurved lobe below the clasper receptacle.

Length of fore wing, 7 mm.

♂ holotype, ♀ allotype in 2% formaldehyde solution, each with abdomen mounted as a microscope preparation; paratypes in British Museum (Nat. Hist.). The shape of the tenth segment of the male, with its recurved apical hooks distinguishes this species from any other African *Cheumatopsyche* known to me.

Cheumatopsyche urema Mosely

UGANDA. L. Victoria, Kagera Bay, 12.v.1954, 1 ♂, 1 ♀ (*N. E. Hickin*); Jinja, 5.v.1954, 1 ♂ (*N. E. Hickin*).

Previous distribution. Kenya, Meru.

There are slight differences in the male genitalia compared with the type but I do not consider them to be of specific importance. The female is referred here with some doubt.

Cheumatopsyche copiosa Kimmins

GOLD COAST. Volta R., Senchi, 31.vii.1950, 3 ♂, 1 ♀ (*L. Berner*).

Previous distribution. Uganda.

Cheumatopsyche afra Mosely

TANGANYIKA. L. Tanganyika, Kigoma, 16.20.viii.1956, 19 ♂, 8 ♀ (*P. S. Corbet*).
Previous distribution. Sierra Leone.

Cheumatopsyche digitata Mosely

UGANDA. Entebbe, 28.30.iii.1956, 4 ♂, 12 ♀ (*P. S. Corbet*).
Previous distribution. Tanganyika.

Subfamily Oestropsinae (= Macronematinae)

Phanostoma senegalense Brauer

UGANDA. Butiaba district, iii.1954; numerous examples (*P. S. Corbet*); Jinja, 3.iii.1954, 2.28.v.1954, ix–x.1954, numerous examples (*P. S. Corbet, N. E. Hickin*); Ripon Falls, 27.v.1954, numerous examples, (*N. E. Hickin*).
GOLD COAST. Volta R., Senchi, 1.viii.1950, 4 ♂ (*L. Berner*).
Widely distributed in Africa.

Polymorphanisus bipunctatus Brauer

KENYA. Nzoia R., Lwamba Ferry, 19–20.iv.1956, 2 ♀ (*P. S. Corbet*).
Widely distributed in Africa.

Polymorphanisus ? angustipennis Ulmer

GOLD COAST. Volta R., Yeji, 14.x.1950, 1 ♂ (*L. Berner*).
Previous distribution. Cameroons.

Aethaloptera dispar Brauer

UGANDA. Butiaba district, iii.1954, a number, (*P. S. Corbet*); Jinja, 3.iii.1954, 2.v–1.vi.1954, ix–x.1954, a number, (*P. S. Corbet, N. E. Hickin*); West Nile, near Laropi, 27–28.iv.1956, 9 ♂, 47 ♀ (*P. S. Corbet*).
TANGANYIKA. L. Victoria, Mwanza Pier, 11–13.viii.1956, 1 ♀ (*P. S. Corbet*).
GOLD COAST. Afram R., 13–14.ix.1950, 3 ♂, 2 ♀; Volta R., Yeji, 14.x.1950, 1 ♂ (*L. Berner*).
Widely distributed in Africa.

Macronema capense, var. ***signatum*** Walker

UGANDA. Kampala, Namogonga R., 4.vi.1954, 1 ♂ (*N. E. Hickin*).
DISTRIBUTION. Equatorial Africa.

Macronema distinctum Ulmer

GOLD COAST. Afram R., Mankrong, 14.ix.1950, 2 ♂ (*L. Berner*).
DISTRIBUTION. Equatorial Africa.

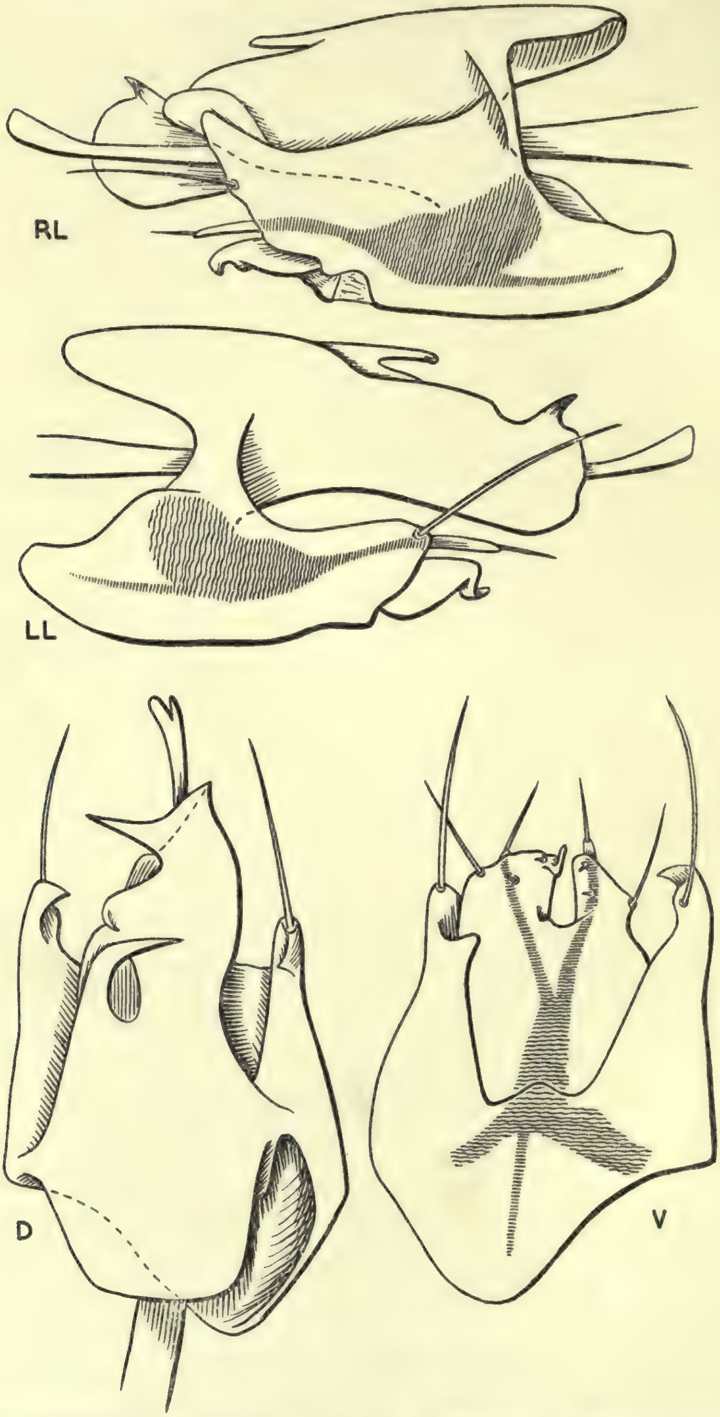

Fig. 8. *Orthotrichia straeleni* Jacquemart. ♂ Genitalia. (RL), right lateral; (LL), left lateral; (D), dorsal and (V), ventral.

Macronema alienum Ulmer

GOLD COAST. Afram R., Mankrong, 13.x.1950, 2 ♂ (*L. Berner*).
Previous distribution. Sudan.

Family HYDROPTILIDAE

Orthotrichia straeleni Jacquemart.

(Text-fig. 8)

UGANDA. L. Victoria, Kagera Bay, 15.v.1954, 1 ♂ (*N. E. Hickin*); Albert Nile, Pakwach, 29.iv.1956, 2 ♂ (*P. S. Corbet*).

TANGANYIKA. L. Tanganyika, Kigoma, 16–20.viii.1956, 1 ♂ (*P. S. Corbet*).

(In alcohol). Head densely clothed with whitish hairs, a few fuscous hairs on face. Antenna with about thirty-eight segments, fuscous, with a short, pale patch at about two-thirds from base. Palpi with fuscous pubescence. Thorax with fuscous pubescence above, ochraceous beneath. Legs very pale fuscous. Wings with dark fuscous pubescence, a pale fuscous patch in pterostigmatic area of fore wing. A short row of black scales in costal area at base of fore wing. Abdomen with short processes to sixth and seventh sternites.

♂ GENITALIA. Completely asymmetric, as is usual in *Orthotrichia*. Ninth segment largely withdrawn within the eighth, with deep basal and apical lateral excisions. In side view, the apical angles of the lower part each bearing a stout bristle, the right-hand lobe more inwardly hooked than the left. To the upper part of the ninth segment is fused the tenth, forming an elongate, lightly sclerotized hood bearing three hooks, two directed to the right, one to the left. To the basal angles of this hood (only visible in a cleared example) is attached a transverse plate, the centre of whose apical margin is produced in a long, bifid process, each branch transparent and bearing an apical seta. Basal margin with a long slender apodeme. This structure lies beneath the aedeagus and may represent the fused processes of the tenth segment. Aedeagus long, slender, with a loosely attached spiniform titillator (not shown in figures, to avoid confusion). Claspers fused to form an asymmetric plate set within an excision of the ninth segment, excised at its centre, each half bearing a long seta. The left-hand clasper terminates in a short, sinuous process.

Length of fore wing 2 mm.

Since this paper was submitted for publication, I have seen a reprint of a paper by M. Jacquemart, in which this species appears under the name of *Orthotrichia straeleni* Jacquemart. I have therefore supressed the name under which I was proposing to describe it but have left my description and figures.

Orthotrichia aequatoriana sp. n.

(Text-fig. 9)

UGANDA. Jinja, 31.xii.1955, 1 ♂, 1 ♀ (*P. S. Corbet*).

(In alcohol). Antenna with thirty-four segments, pale ochraceous, with three patches of fuscous pubescence in the apical half. Head fuscous, vertex ochraceous with fuscous warts, palpi pale fuscous. Anterior legs pale fuscous, clothed with broadened fuscous hairs, median and posterior legs ochraceous. Spurs 0.3.4. Pubescence of fore wing fuscous with paler areas, no black scales at base of subcosta in male. ♂ genitalia of the usual, complex type, asymmetric. Sixth ventral segment with a pointed process, seventh and eighth with tufts of hairs. Ninth segment long dorsally, with a pair of processes on the right-hand side apically, the upper short and claw-like, the lower long, slender, slightly upcurved. Ventral apical margin of the ninth segment irregular, its centre produced and with short, outspread apical branches; between and above them is an irregularly produced, blackened lobe. Above this lobe is a pair of rounded structures, each carrying a long bristle, their bases fused into a long, slender apodeme. It is possible that these structures may represent the claspers. Tenth segment membranous. Aedeagus long, slender, sinuous in its apical third and with a spiral sheath or titillator. Within

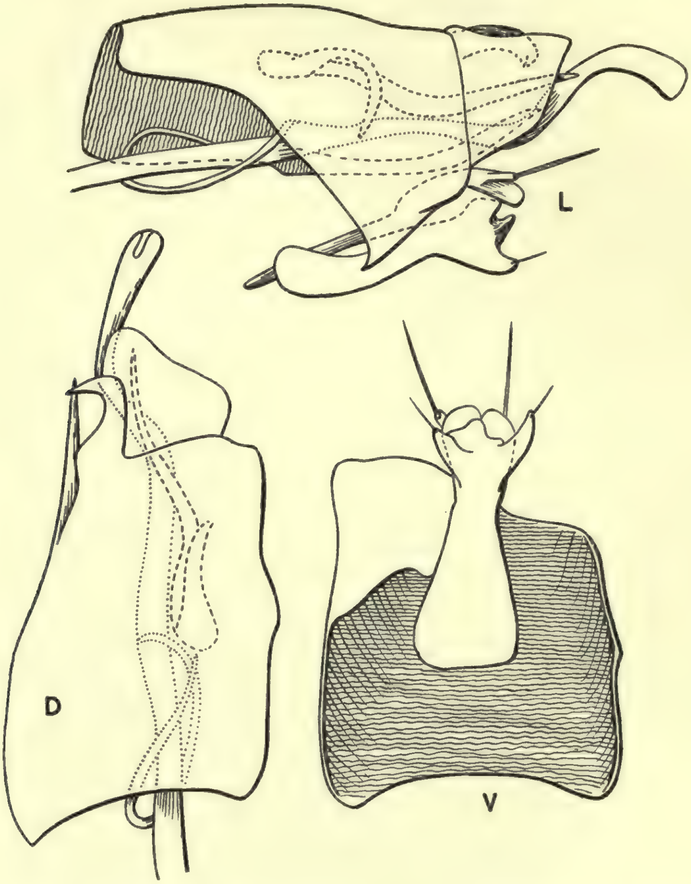

Fig. 9. *Orthotrichia aequatoriana* sp. n. ♂ Genitalia. (L), lateral; (D), dorsal; (V), ventral.

the ninth segment and above the aedeagus are two spines, fused basally, one short and claw-like, the other long, slender and sinuous.

Length of fore wing 2·5 mm.

♂ holotype mounted as microscope preparations. This species differs from *O. sanya* and *O. straeleni* in the absence of a row of black scales along the subcosta of the fore wing of the male and in the form of the male genitalia.

Family Leptoceridae

Pseudoleptocerus corbeti sp. n.

(Text-figs. 10, 11)

Uganda. Jinja, 7.v–10.viii.1956, 28 ♂, 40 ♀ (*P. S. Corbet*).

(In alcohol). Head fuscous, with whitish and fuscous hairs. Basal segment of antenna fuscous above, paler beneath, remaining segments clothed with medium fuscous, scale-like hairs, joints dark fuscous, bases of segments whitish. These pale annulations become less noticeable towards the apex of antenna. Palpi dark fuscous, maxillary with greyish white and some fuscous hairs. Prothorax and mesothorax fuscous, metathorax ochraceous with fuscous markings. Legs fuscous,

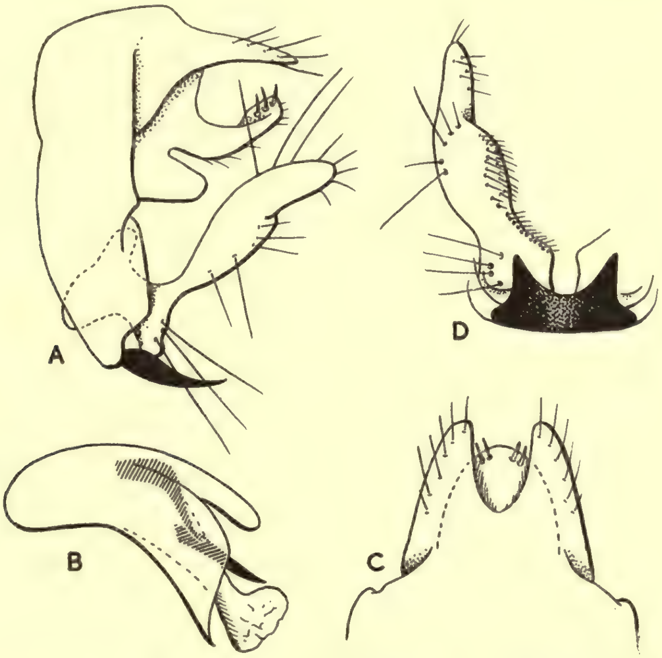

Fig. 10. *Pseudoleptocerus corbeti* sp. n. ♂ Genitalia. (A), lateral (aedeagus omitted); (B), aedeagus, lateral; (C), ninth and tenth segments, dorsal; (D), clasper and process of ninth segment, ventral.

anterior tibia and tarsus annulated with whitish, posterior femur with pale bluish scales. Abdomen fuscous above, ochraceous beneath, ♂ genital segments brownish, a piceous bifid lobe on ninth sternite. Wings much as in *Ps. njalaensis* and *chirindensis*, anterior with hyaline areas, and clothed with blackish and iridescent pale bluish scales.

♂ GENITALIA. Dorsal apical margin of ninth segment produced in an excised hood, the U-shaped excision extending almost to the base of the hood, the lateral lobes broad, triangular, with rounded apices. From the side the lateral lobes are slender and slightly down-curved. Ventral margin of ninth sternite produced in a blackened, plate-like lobe, paler at its centre. In side view it is slender and acute, from beneath bifid, the acute angled separated by a wide excision. Tenth segment with a broad, rounded median lobe, armed with a few stout spines on each side of the apex. From the side, the median lobe appears as a slender curved process, whose apex is truncate. Lateral lobes of tenth segment thin, blunt, scarcely half as long as median lobe. Aedeagus enclosed in a curved basal sheath, whose upper margin projects as a quadrate lobe, the lower margin produced and acute. Aedeagus largely membranous, with two pairs of stout spines. Clasper stout at base, then much constricted in side view, dilating gradually to a digitate apex. From beneath it is also constricted near the base and again beyond the middle. Inner margin strongly spinose.

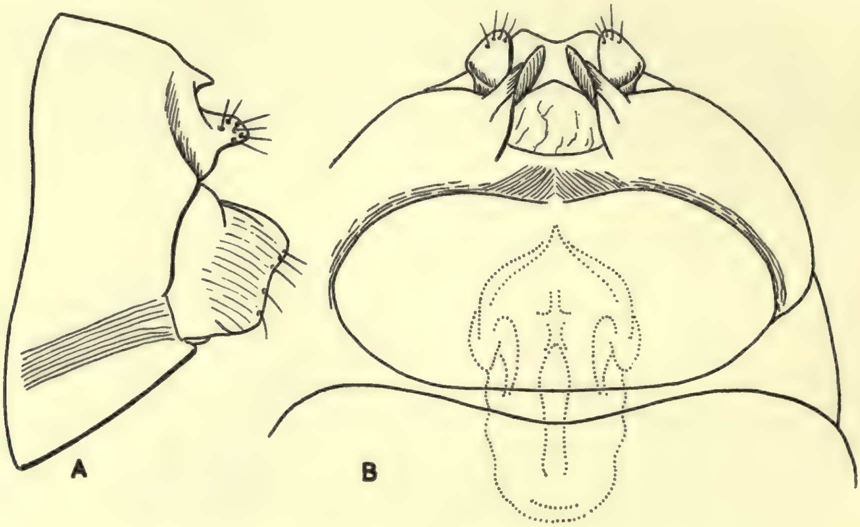

FIG. 11.—*Pseudoleptocerus corbeti* sp. n. ♀ Genitalia.
(A), lateral; (B), ventral.

♀ GENITALIA. Eighth sternite with its apical margin widely and shallowly excised. Ninth and tenth segments fused, dorsal apical margin projecting in a short, excised lobe, which appears as a triangular process in side view. Below it is a pair of short processes (? cerci) armed with a few setae. Lateral gonapophyses short, moderately deep in side view, apical margin slightly excised or sinuous. Above them in ventral view is a short triangular plate. Ninth sternite forming a broad ovate plate, its lateral margins more or less fused to the tergite.

Length of fore wing, ♂, 7·5 mm., ♀, 5·5 mm.

♂ holotype, ♀ allotype (8.viii.1956) mounted as microscope preparations, paratypes in 2% formaldehyde solution. In wing markings and in general structure of ♂ and ♀ genitalia this species resembles *njalaensis* Mosely and *chirindensis* Kimmins. One obvious distinguishing character is the bifid ventral process of the ninth sternite of the male. (In *chirindensis* an unpigmented median area of this process may simulate a forked process.) The median lobe of the tenth segment has the spines on each side of the apex (median in *njalaensis* and *chirindensis*). The clasper is more slender than in *njalaensis* and the apex less angulated than in *chirindensis* and is not outspread. In the female, the processes of the tenth segment are short and stout. In *njalaensis* they are also short, but more triangular in side view, and from beneath they are strongly transverse. In *chirindensis* these processes are much more slender, about three times as long as broad in side view. The lateral gonapophyses in *corbeti* are truncate or slightly excised apically in side view, not rounded as in *njalaensis* and *chirindensis*.

Pseudoleptocerus njalaensis Mosely

Gold Coast. Volta R., Senchi, 2.viii.1950, 1 ♂, 1 ♀, Yeji, 14.x.1950, 6 ♂, 2 ♀; Afram R., Mankrong, 14.ix.1950, 1 ♂ (*L. Berner*).

Previous distribution. Sierra Leone.

Triaenodes serrata Ulmer

(Text-fig. 12)

1912, *Deutsch. Zentr.-Afrika-Exped.* **4** (Zool. 2) (6) : 110 ; *ibid.*, 1923, *Mitt. Münch. ent. Ges.* **13** : 20.

Uganda. Jinja, 14.v–8.viii.1956, 2 ♂, 3 ♀, (*P. S. Corbet*).

I am taking this opportunity of describing the female genitalia and of re-figuring the male genitalia and also of drawing attention to a curious series of errors in connection with the description of the male genitalia. Originally it was stated that the tenth tergite was divided and that each half bore a long, curved spine. Ulmer subsequently (1923) corrected this, stating that the tenth tergite was not divided and that it bore only a single spine. This correction was overlooked by both Barnard (1934) and myself (1956) and we perpetuated the original error by referring to the paired spines of *serrata* in comparative notes. Through the kindness of Dr. Mannheims and Dr. Buchholz, of the Koenig Museum, Bonn, I have been able to examine Ulmer's type of *serrata*. To my surprise, I find that it does in fact bear *two* curved spines at the apex of the *undivided* tenth tergite! The lateral margins of the latter are more sclerotized and thus give the false impression of being divided. I am of the opinion that the type is probably aberrant in having two spines on the tenth tergite and that there should normally be only one, as appears to have been

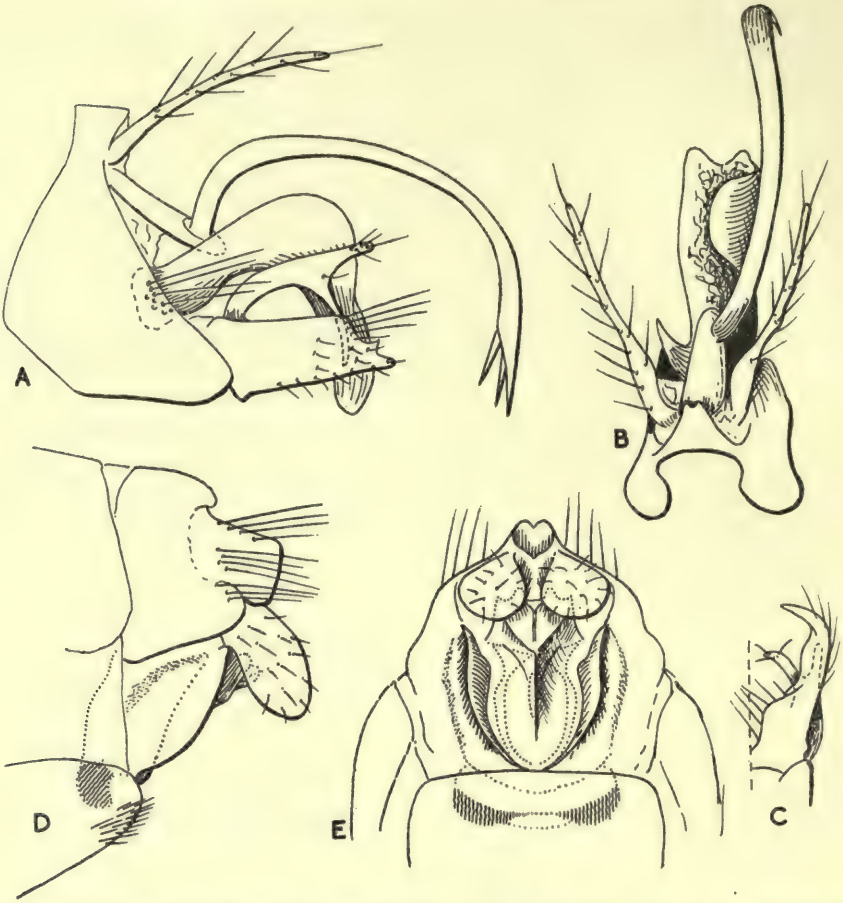

Fig. 12. *Triaenodes serrata* Ulmer. Genitalia. (A), ♂, lateral; (B), ♂, ninth and tenth segments and aedeagus, dorsal; (C), ♂, right clasper, ventral; (D), ♀, lateral; (E), ♀, ventral.

the case in the later specimens from which Ulmer corrected his original description. There are slight differences between the Uganda examples and Ulmer's type in the shape of the curved spine and of the clasper, but I do not consider them to be of specific importance.

Barnard (1934) when describing his *Adicella sicula* also remarks on its similarity to *Triaenodes serrata*. The similarity of genitalia, not only in the male, but also in the female *sicula* to those of the female now described as *serrata* causes one to wonder whether his *sicula* is not perhaps a *Triaenodes* with abberrant venation. This view is strengthened by the fact the two species of *Triaenodes* (*legona* and *wambana*) described by Mosely from Kenya and Ruwenzori both show a partly obsolete media in the fore wing, the base only being lacking.

♀ GENITALIA. Apical margin of eighth sternite straight, with a large patch of short bristles. Ninth tergite short, more or less fused to the tubular tenth segment.

Lateral gonapophyses elongate-oval, directed downwards and inwards. Ninth sternite moderately sclerotized, deeply excised at its centre, within which can be seen the internal structure, with a bilobed apex.

Triaenodes ghana sp. n.

(Text-figs. 13, 14)

Gold Coast. Dayi R., Kpandu-Hohoe Rd., 17.viii.1950, 1 ♂ (*L. Berner*).

(In alcohol). Head ochraceous, eyes black, palpi ochraceous. Antenna with long basal segment bearing long silky hairs on its upper surface. Thorax, legs and abdomen ochraceous. Wings with sparse pale fuscous pubescence.

♂ genitalia. Ninth segment narrowed dorsally, the lower part about twice as long as upper and more sclerotized. Dorsal margin produced at its centre in a small, bifid, membranous process. Tenth segment long, spiniform, slightly downcurved. Cerci slender, nearly as long as tenth segment. Aedeagus large, downcurved, strongly sclerotized. It takes the form of a trough with asymmetric lateral margins, which are armed with strong spines, closely bunched on the left side, more spread out on the right. Beneath the apex is another bunch of strong spines. Claspers fused at their bases, rather complex. The main or basal part of each is quadrate in side view, with a finger-like process, armed with stout setae, arising from the upper margin towards the apex. Apical margin with an incurved apical hook and a smaller tooth. From beneath the basal part is triangular, the inner margin

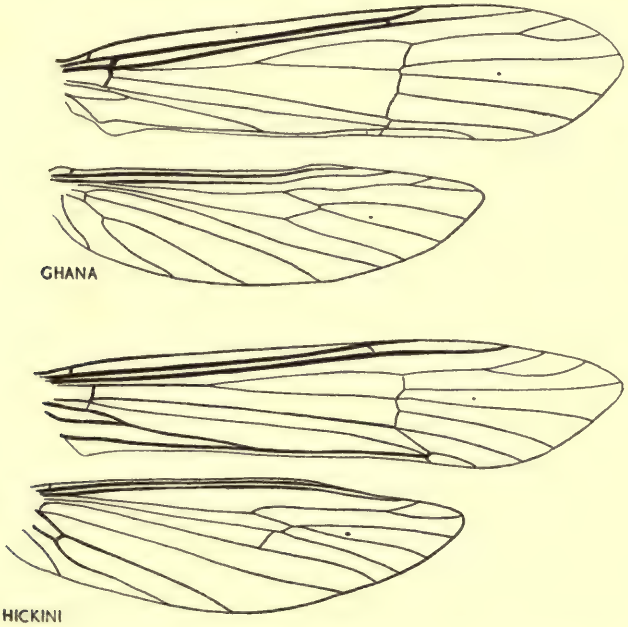

Fig. 13. Wings of *Triaenodes ghana* sp. n. and *T. hickini* sp. n.

of the upper finger-like process continuing as the inner margin of the clasper. From the upper surface of the clasper arises a bifid process, the upper branch digitate, directed tailward, the lower branch larger, flattened, directed downwards and inwards, apex acute.

Length of fore wing 7·5 mm.

♂ holotype in 2% formaldehyde solution, one pair of wings and genitalia mounted as microscope preparations. In structure of genitalia this species is related to *Triaenodes kimila* Mosely from Belgian Congo. It differs in the presence of strong setae on the lateral margins and apex of the aedeagus and the bifid nature of the process of the clasper. There is no mention of any special tufts of silky hair on the basal segment of the antenna in *T. kimila,* and one must assume that they were either rubbed off or else naturally absent, since if they had been present, Mosely would certainly have placed the species in his genus *Triaenodella.*

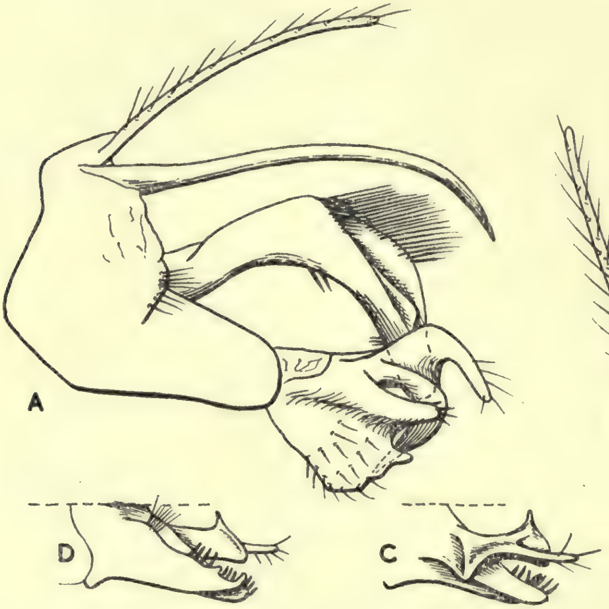

FIG. 14. *Triaenodes ghana* sp. n. ♂ Genitalia. (A), lateral; (B), tenth segment, dorsal; (C), left clasper, dorsal; (D), right clasper, ventral.

The specific name of this species is that adopted by the former Gold Coast territories upon attaining self-governing status within the British Commonwealth.

Triaenodes hickini sp. n.

(Text-figs. 13, 15)

KENYA. Kipkurere R., Timboroa Forest Reserve, Austins Bridge, 8,500 ft., emerged 20.x.1956, 1 ♂, 1.xi.1956, 2 ♂, 1 ♀, 7.xi.1956, 1 ♂, 1 ♀, 9.xi.1956, 2 ♀ (*N. E. Hickin*)

(In 2% formaldehyde solution). Head yellowish, fuscous above, antenna fulvous with fuscous annulations, basal segment of male elongate, dorsal surface with a pale longitudinal flap covering a tuft of hairs. Palpi pale fuscous with darker pubescence. Thorax yellowish, with faint fuscous streaks above, sides ochraceous. Legs very pale fuscous. Abdomen ochraceous, genitalia yellowish-brown. Wings with pale fuscous pubescence, with faint indications of transverse bands.

♂ GENITALIA. Ninth segment narrow dorsally, side-pieces triangular with rounded apices. Tenth segment with a pale trifid median lobe, the centre branch clavate and setose. Side lobes of tenth segment asymmetric, blade-like, the left lobe much longer than the right. Aedeagus arched, trough-like, apex directed downwards, excised and somewhat membranous. Clasper with a basal branch, the main part subtriangular from beneath, apex rounded, inner margin sinuous and armed with short spines or teeth. The basal branch is directed upwards and then bent abruptly tailwards as a strong spine. Just below the angle is a second more slender spine, curving downwards.

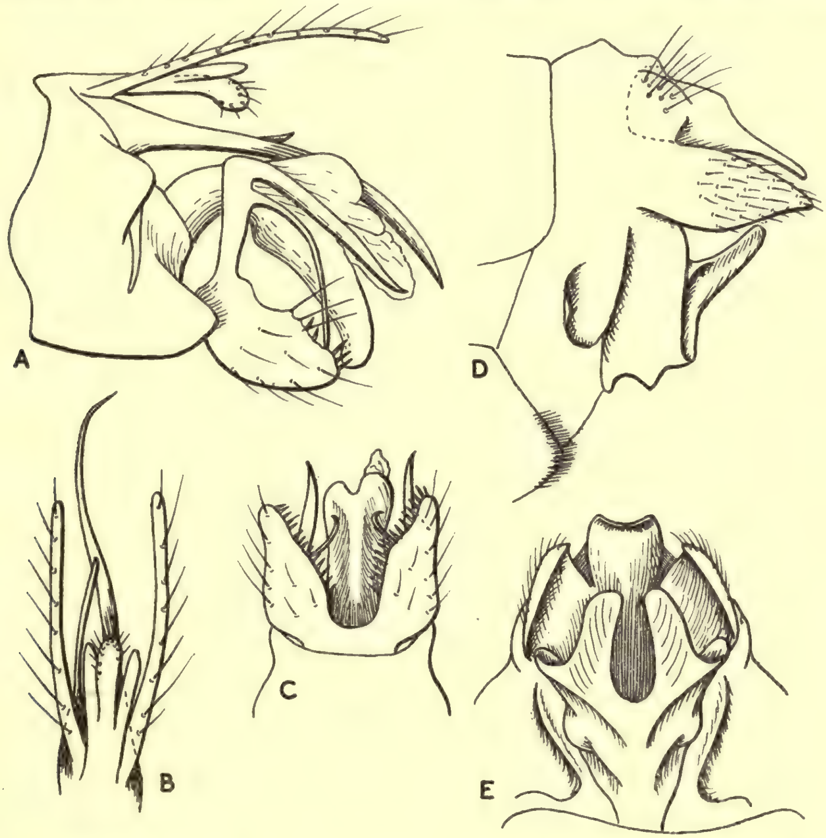

FIG. 15. *Triaenodes hickini* sp. n. Genitalia. (A), ♂, lateral; (B), ♂, tenth segment, dorsal; (C), ♂, ventral; (D), ♀, lateral; (E), ♀, from beneath and behind.

♀ GENITALIA. Ninth tergite with a weak median carina. Lateral gonapophyses elongate, foliate, somewhat incurved and acute apically. Beneath them is a broad, bifid structure, deep in side view, the branches appearing as upwardly directed fingers. From beneath, these branches are separated by a deep excision. Tenth segment more or less fused to ninth, from the side moderately broad at its base (which carries a low setiferous wart), then narrowed to a slender digitate apex, slightly down-curved. From below it is spatulate, shallowly concave above.

Length of fore wing 10 mm.

♂ holotype in 2% formaldehyde solution, abdomen and one pair of wings mounted as microscope preparations. This species may be compared with *Triaenodes difformis* Mosely from Uganda. The median lobe of the tenth segment is shorter, view less elongate and with the basal branch stouter, more abruptly angled, its trifid, centre branch clavate. Clasper in ventral view more triangular, in lateral upper branch not clavate. *T. difformis* may have a longitudinal flap on the basal segment of the antenna but the specimen is in poor condition.

Athripsodes jinjana sp. n.

(Text-figs. 16, 17)

UGANDA. Jinja, 1956, 27 ♂, 22 ♀; L. Victoria, Bukakata, 13.i.1956, 2 ♀; Kampala, Port Bell, 6–7.iv.1956, 2 ♂, 1 ♀; Entebbe, 28–30.iii.1956, 2 ♂, 1 ♀, (*P. S. Corbet*).

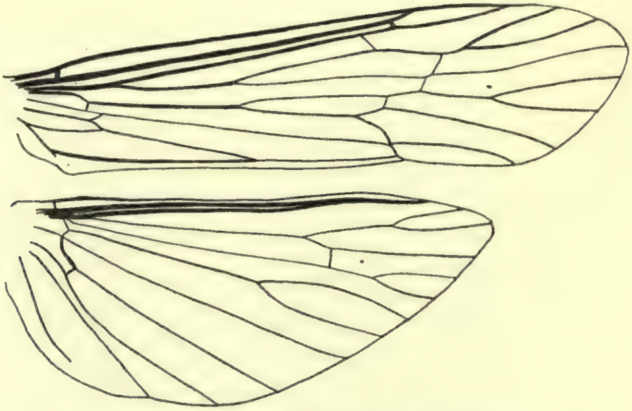

FIG. 16. Wings of *Athripsodes jinjana* sp. n. ♂.

(In alcohol). Head ochraceous, warts fuscous, hairs whitish. Antenna ochraceous, annulated with dark fuscous. Maxillary palpi dark fuscous, with whitish hairs, labial pale fuscous. Thorax dull brownish, hairs whitish. Legs ochraceous, anterior femur ventrally, and most of anterior tibia and tarsus, pale fuscus. Abdomen whitish (? greenish in life), male genital segment yellowish brown. Fore wing with brownish pubescence, mottled with greyish, stigma dark brown.

Membrane pale smoky brown, with hyaline areas and, in male, venation much as in "*Homilia*" *lomia* Mosely.

♂ GENITALIA. Ninth segment narrowed dorsally, ventral apical margin not produced. Tenth segment forming a pair of long, curved spines, fused basally, apices divergent. Cerci slender, about two-thirds as long as tenth segment. Aedeagus short, abruptly angled downwards between the bases of claspers, where its apex can be seen in ventral view as a rounded lobe. Lateral margins of aedeagus produced upwards in vertical flanges. Claspers forming a pair of slender calipers arising from stout bases. From the side there is a triangular projection arising on the upper surface at the base, and beyond it is a stout, hooked process on the inner margin near the base.

♀ GENITALIA. Ninth sternite tapering towards its apex, apical margin straight, excised at its centre, the excision bordered by two rounded lobes, base of the excision convex. Lateral gonapophyses dilated mid-way in ventral view, roundly quadrate in side view.

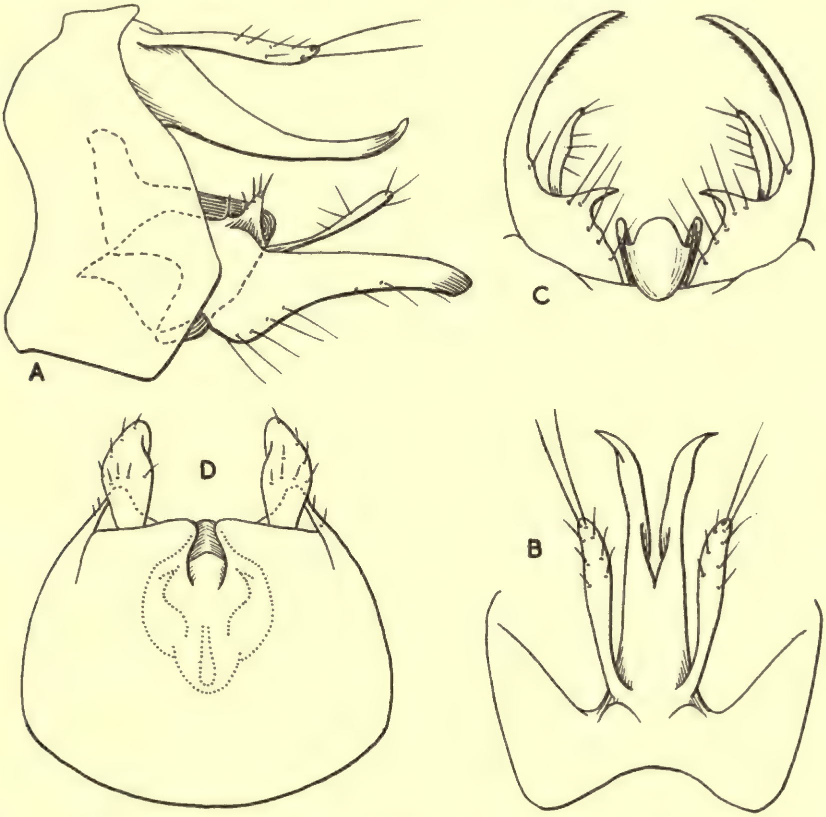

FIG. 17. *Athripsodes jinjana* sp. n. Genitalia. (A), ♂, lateral; (B), ninth and tenth segments, dorsal; (C), ♂, claspers and aedeagus, ventral; (D), ♀, ventral.

Length of fore wing ♂, 7 mm., ♀, 7·5 mm.

♂ holotype mounted as microscope preparations, ♀ allotype in 2% formaldehyde solution, with one pair of wings and abdomen mounted as microscope preparations, paratypes in 2% formaldehyde solution. This species can be grouped with *Athripsodes moselyi* Kimmins and *A. curvata* (Ulmer) (and also with "*Homilia*" *lomia* Mosely) on the structure of the male genitalia. It is perhaps closest to *A. moselyi*, from which it differs in the less elevated flanges of the aedeagus, stouter cerci, divergent spines of the tenth segment and hooked process on the inner, lower margin of clasper. The female may be distinguished by the blunter cerci, absence of the scabrous lobes in the excision of the ninth sternite and broader internal structure. The general similarity of the male genital structure to that of *Homilia lomia* is striking and strengthens the probability that the female of *lomia* will be found to have typical *Athripsodes* venation.

Oecetis berneri sp. n.

(Text-figs. 18, 19)

Gold Coast. Dayi R., Kpandu-Hohoe Rd., 17.viii.1950, 1 ♂ (*L. Berner*).
(In alcohol). Head ochraceous, antennae very pale fulvous with fine fuscous annulations, palpi pale fuscous. Thorax pale brownish above, ochraceous at sides, legs very pale fuscous. Wings hyaline, fore wing with fulvous pubescence, pale fuscous over cross-veins and forks. Venation as figured. Abdomen pale fuscous, tergites 5–8 with reticulate patches.

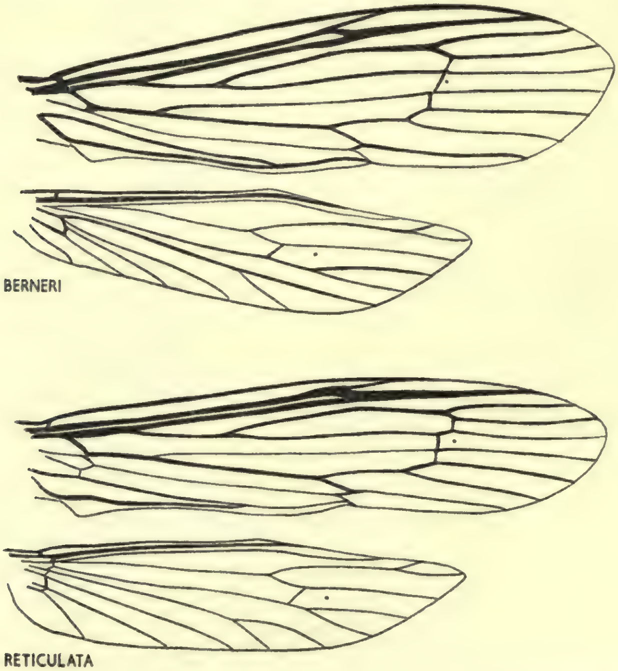

Fig. 18. Wings of *Oecetis berneri* sp. n. and *O. reticulatella* sp. n.

♂ GENITALIA. Ninth segment narrowed above. Tenth segment represented by two slender, asymmetric spines, down-curved, the left-hand spine in side view sinuously bent. Between their bases arises a pair of short, clavate appendages (? cerci), each with a tuft of setae at the base. Median lobe of tenth segment apparently obsolete. Aedeagus slender, bent downwards about mid-way, channelled on its upper surface, lateral margins of basal half expanded upwards in thin rounded plates. Clasper stout, bifid apically, upper branch arising about mid-way along dorsal surface, curving obliquely upward and tailward, slightly clavate. Main branch tapering to an acute apex, which is slightly hooked. In ventral view the clasper is narrowly triangular, inner margin forming a sinuous ridge and with a blunt triangular tooth on the lower surface.

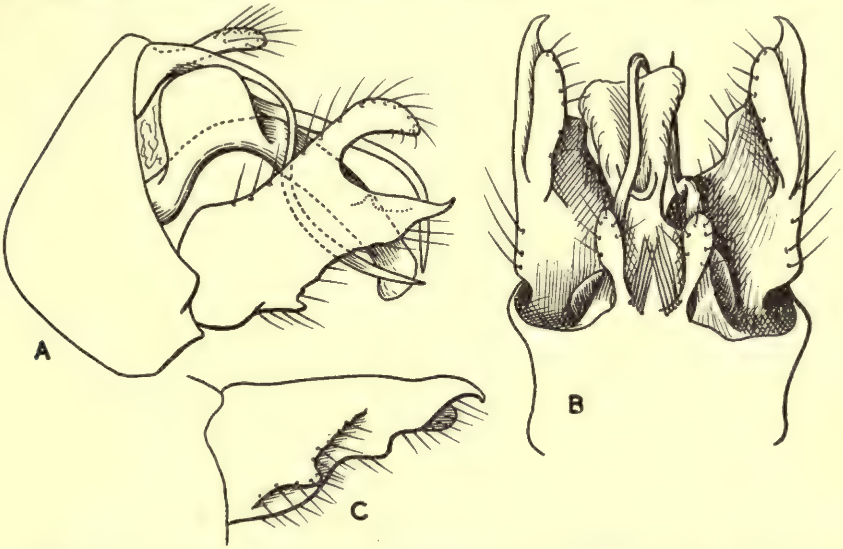

FIG. 19. *Oecetis berneri* sp. n. ♂ Genitalia. (A), lateral; (B), dorsal; (C), left clasper, ventral.

Length of fore wing 4·5 mm.

♂ holotype in 2% formaldehyde solution, one pair of wings and abdomen mounted as microscope preparations. This species does not seem to have any very close relationship with the other African species of *Oecetis* having reticulate patches on the male tergites. The dilated lateral margins of the basal half of the aedeagus, the absence of the median lobe of the tenth segment and the structure of the clasper should make its recognition easy.

Oecetis reticulatella sp. n.

(Text-figs. 18, 20)

GOLD COAST. Volta R., Yeji, 14.x.1950, 1 ♂ (*L. Berner*).

(In alcohol). Head fulvous with brownish pubescence. Antennae (incomplete) fulvous with fuscous pubescence. Palpi pale fuscous. Thorax fulvous, sides and centre of mesonotum brownish. Legs fulvous. Wings hyaline, pubescence of anterior pale fuscous, slightly darker at cross-veins and arculus. Venation as figured. Abdomen ochraceous, tergites 5–8 in male with reticulate patches on each side.

♂ GENITALIA. Ninth segment short, apical margin from the side shallowly excised, from above also with a rounded median excision, the rounded lobes on each side possibly representing the cerci and lateral lobes of tenth segment, fused to the margin of the ninth. Median lobe forming a long, slender finger. Aedeagus large, arched downwards, forming an asymmetric trough enclosing a single, curved spine. Claspers stout, fused basally, upper apical angles extended in strong calipers.

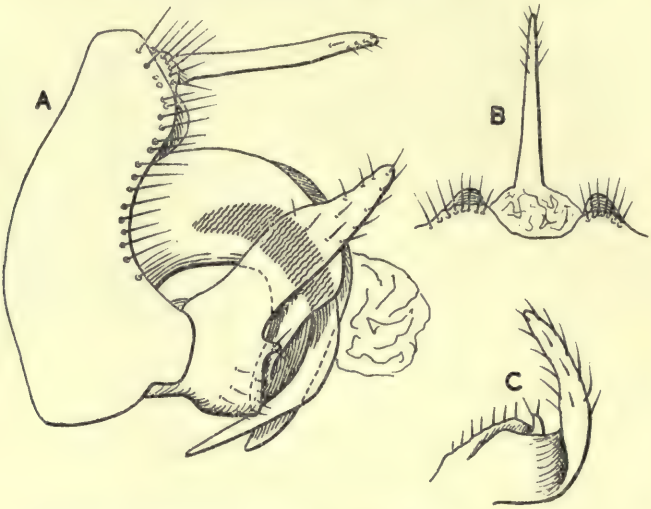

FIG. 20. *Oecetis reticulatella* sp. n. ♂ Genitalia. (A), lateral ; (B), tenth segment, dorsal ; (C), left clasper, dorsal .

Length of fore wing 5 mm.

♂ holotype in 2% formaldehyde solution, one pair of wings and abdomen mounted as microscope preparations. The presence of reticulate areas on the fifth to eighth tergites links this species with *O. choa* Mosely and *O. setifera* Ulmer. The tenth segment is however more reduced, since there appears to be no trace of the lateral lobes and the apices of the claspers are more acute.

Oecetis africana sp. n.

(Text-figs. 21, 22)

UGANDA. Mengo, Entebbe, 28–30.iii.1956, 9 ♂, 5 ♀ (*P. S. Corbet*).

TANGANYIKA. L. Victoria, Mwanza Pier, 11–13.viii.1956, 2 ♂, 1 ♀ (*P. S. Corbet*).

(In alcohol). General colour light fuscous or dull ochraceous. Antenna annulated with piceous. Wings sparsely pubescent, fore wing with anastomosis, bases of discoidal and thyridial cells and arculus marked with fuscous. Abdomen with tergites six to eight with reticulate areas.

♂ GENITALIA. Ninth segment narrowed above, dorsal apical margin produced at centre in two small, semi-membranous fingers. Ventral apical margin triangularly produced. Cercus narrowed at base, foliate. Tenth segment forming two spatulate lobes, slender and spiniform from above. Aedeagus membranous, set in a down-curved, sclerotized trough and with a membranous, extensile sheath arising near its base. This sheath terminates in a divergent, horn-like structure. Clasper short, subtriangular from beneath, apex hooked inward. From the side, the upper margin is strongly convex, apex concave.

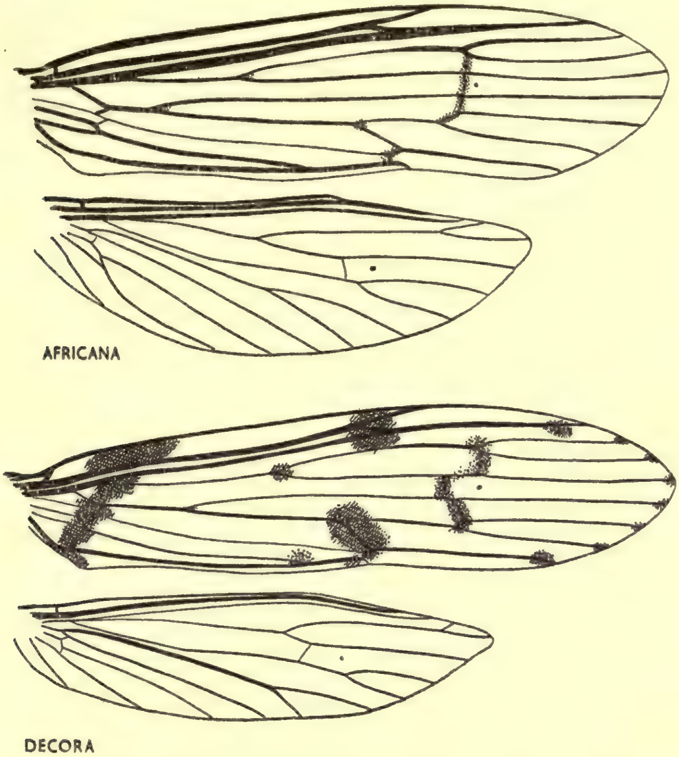

FIG. 21. Wings of *Oecetis africana* sp. n. and *O. decora* sp. n.

♀ GENITALIA. Eighth sternite produced in a large, subgenital plate with a rounded slightly down-curved apex. Tenth segment fused to ninth, tubular, lower margin projecting beyond the upper, bilobed. On each side of the tenth segment is a large, low, setiferous wart. Lateral gonapophyses short, ovate from the side, tapering towards apex from beneath.

Length of fore wing 7 mm.

♂ holotype with wings and abdomen mounted as microscope preparations, ♀ allotype with abdomen mounted as microscope preparation and paratypes, all in 2% formaldehyde solution. This species is related to *O. aganda* Mosely and *O.*

anomala Marlier. All have the deeply bifid tenth segment in the male and the single extensile sheath of the aedeagus, terminating in divergent horns. (Mosely suggests that in *aganda* this process is normally paired, one being broken away, but I think that this is a misinterpretation). *O. africana* differs from both the above species in the short claspers and broader, foliate cerci.

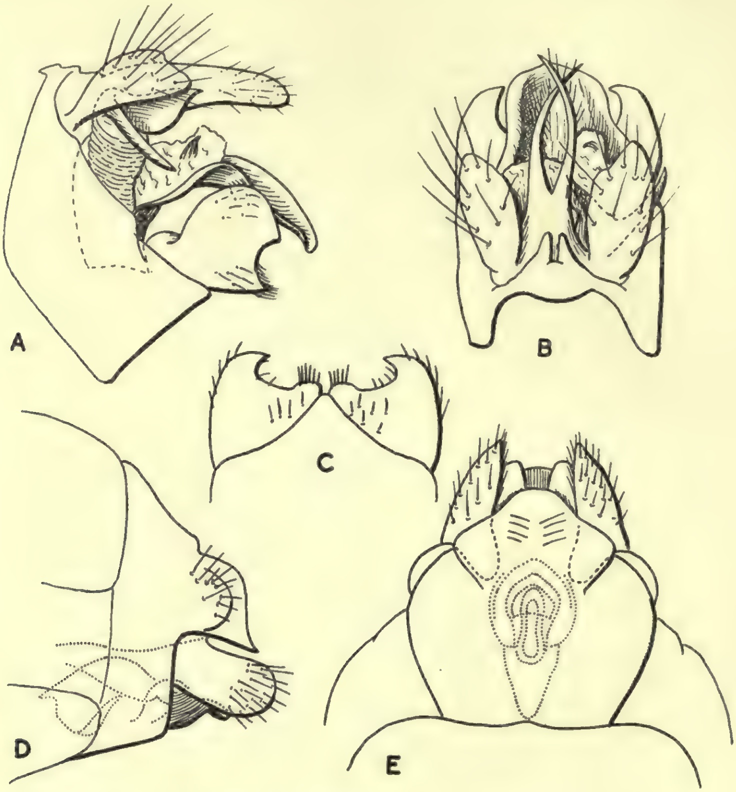

FIG. 22. *Oecetis africana* sp. n. Genitalia. (A), ♂, lateral; (B), ♂, dorsal; (C), ♂, claspers, ventral; (D), ♀, lateral; (E), ♀, ventral.

Oecetis decora sp. n.

(Text-figs. 21, 23)

TANGANYIKA. L. Tanganyika, Kigoma, 16–20.viii.1956, numerous ♂ ♀ (*P. S. Corbet*).

(In alcohol). General colour ochraceous. Back of head pale fuscous, antenna annulated with fuscous. Dorsum of abdomen pale fuscous. Wings sparsely pubescent (? denuded), ochraceous and fuscous, membrane of fore wing strongly marked with fuscous as follows: An oblique, transverse band close to base from costa to anal angle, interrupted at radial area ; a small spot at base of discoidal cell ; a large spot over cross-vein between *Sc* and R_1, extending to R_2 ; a large spot over the base of cell Cu_{1a} and arculus ; small spots at junction of 1*A* and 2*A*, at anastomosis and apices of veins. Venation as figured, cell R_2 in hind wing present.

♂ GENITALIA. Ninth tergite produced at its centre in a small, bifid process. Cerci short, broad and ovate, closely appressed but not fused with the tenth segment, which is lightly sclerotized, about twice as long as cercus, narrow and truncate. Aedeagus large, globose, apex hooked downward, with a curved, internal spine. Claspers slender, incurved, upper margin humped about mid-way.

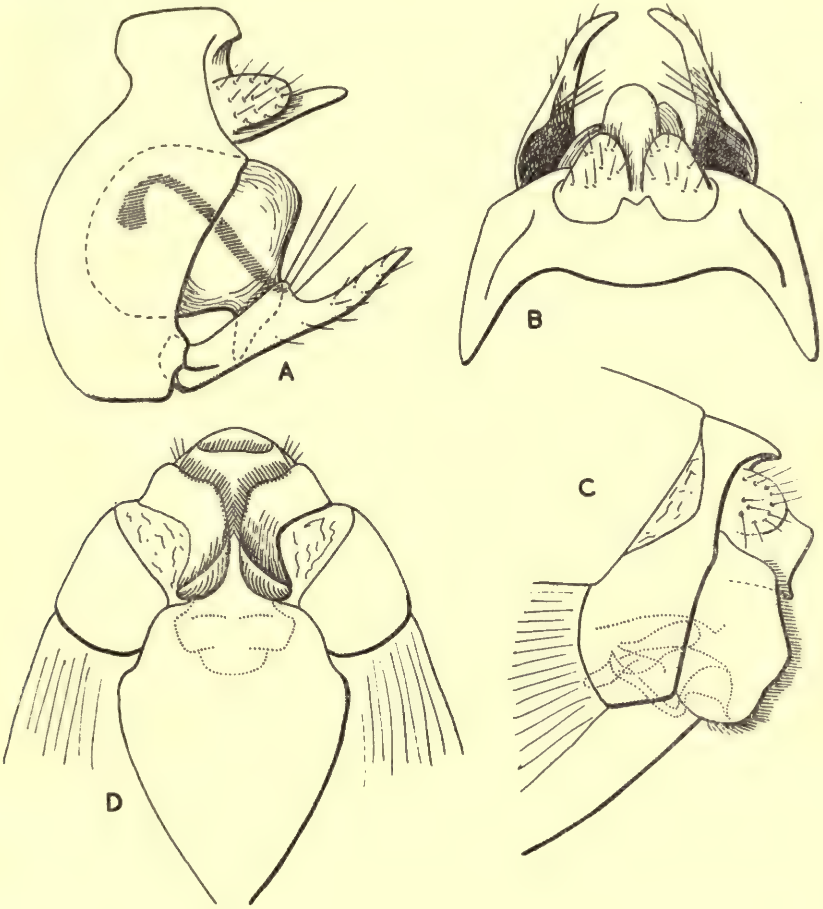

FIG. 23. *Oecetis decora* sp. n. Genitalia. (A), ♂, lateral ; (B), ♂, dorsal ; (C), ♀, lateral ; (D), ♀ ventral.

♀ GENITALIA. Ninth tergite produced at the centre of its apical margin in a narrow triangle. Tenth segment short, tubular, with a large setiferous wart on each side. Lateral gonapophyses of the ninth segment short, deep and concave, apical margin sinuous, fringed. Eighth sternite (or subgenital plate) tapering to a narrow base, apex covered by the lateral gonapophyses.

Length of fore wing ♂, 6 mm.

♂ holotype mounted as microscope preparations, ♀ allotype in 2% formaldehyde solution, apex of abdomen mounted as microscope preparation, paratypes in 2% formaldehyde solution. In male genital structure this species closely resembles *O. maculata* Kimmins, differing in the shorter cerci, truncate tenth segment and more slender claspers. The pattern of the fore wing is very striking and entirely different from *O. maculata*. *O. hulstaerti* Návas and *O. janseni* Návas have strongly patterned wings but the arrangement of the spots and bands is different. The resemblance in male genital structure of this species and *O. maculata* to species of *Setodellina* gives rise to doubts whether the fusion of the cerci with the tenth segment to form a hood is a sufficiently good distinguishing character. In the present species the distinction is by no means clear-cut.

Setodellina maculipennis Ulmer

Gold Coast. Volta R., Senchi, 2.viii.1950, 2 ♂ (*L. Berner*).

Dayi R., Kpandu-Hohoe Rd., 17.viii.1950, 1 ♀ (*L. Berner*).

Previous distribution. Sudan, Uganda.

Ptochoecetis africana Ulmer

Gold Coast. Volta R., Yeji, 14.x.1950, 1 ♂, 1 ♀ (*L. Berner*).

Previous distribution. Sierra Leone.

Setodes baccata sp. n.

(Text-figs. 24, 25)

Uganda. Jinja, 9.v–15.viii.1956, 17 ♂, 7 ♀ (*P. S. Corbet*).

(In alcohol). Head piceous, with piceous and silvery hairs. Antenna fuscous, annulated with whitish in basal half. Palpi fuscous, with grey pubescence. Thorax dark fuscous above, ochraceous on sides. Legs fuscous, anterior tibia with dense blackish pubescence, base and apex of anterior tarsus with blackish pubescence, intermediate segments whitish. Abdomen ochraceous. Fore wing with dense brownish pubescence, decorated with five conspicuous, iridescent, pearly white patches of hairs, each ringed with dark brown. One is near the base of Cu_2, one on Rs, one near arculus and two near apex of discoidal cell. Venation fairly typical of genus, in fore wing cells R_2 and M_1 reaching anastomosis.

♂ genitalia. Ninth segment short, its dorsal apical margin slightly produced at its centre. Tenth segment fused to ninth, forming a hood, whose lower apical angles are extended in thin spatulate lobes, set on edge. Cerci flattened, triangular in dorsal view. Aedeagus short and stout, concealed, its apex curving downward between the bases of the claspers. On the upper surface of the aedeagus near the base is a single blade-like process, directed tailward. Clasper trifid, the two outer branches widely divergent, the upper of these two curving inward, the lower directed tailward, broad in ventral view. The third branch arises from the inner surface at the base. It is triangular in side view, directed upward and tailward.

♀ GENITALIA. Eighth sternite extended in a subgenital plate, broad and convex at its base, hairy, tapering to a narrow rounded apex. Lateral gonapophyses of ninth segment large, convex, upper apical angle rounded, heavily fringed with hairs, lower angle projecting in a small, rounded, spinose process. Tenth segment fused to ninth, hood-like, bifid.

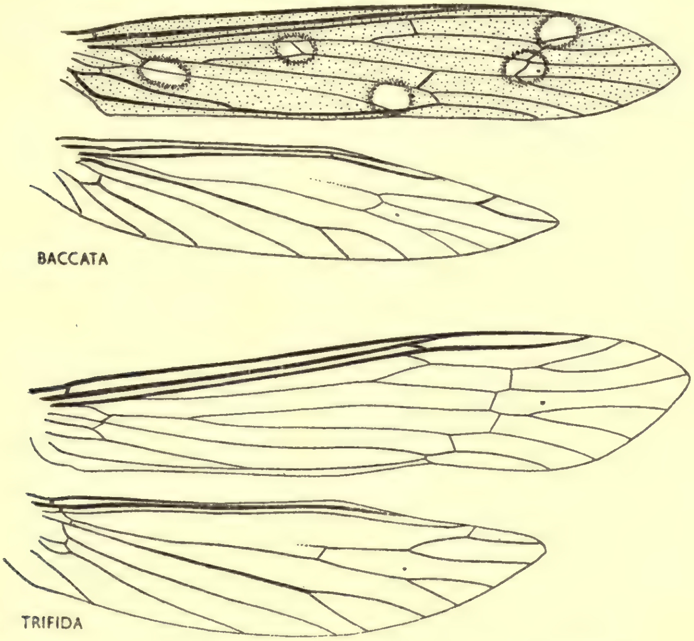

FIG. 24. Wings of *Setodes baccata* sp. n. and *S. trifida* sp. n.

Length of fore wing, ♂, 5–5·5 mm.

♂ holotype and ♀ allotype mounted as microscope preparations, paratypes in 2% formaldehyde solution. The pearly spots on the fore wing of this species should make it easily recognizable. The male genitalia are lightly sclerotized and with the rather concealed aedeagus, the male might easily be passed over as a female, as indeed did both Dr. Corbet and myself at first glance. It is quite distinct from the other described African species of *Setodes* and comes nearest to *S. excisa* Kimmins. The male genitalia also show considerable resemblance to those of *Hemileptocerus gregarius* Ulmer, from which it is separated by the narrower wings and pattern of the fore wings.

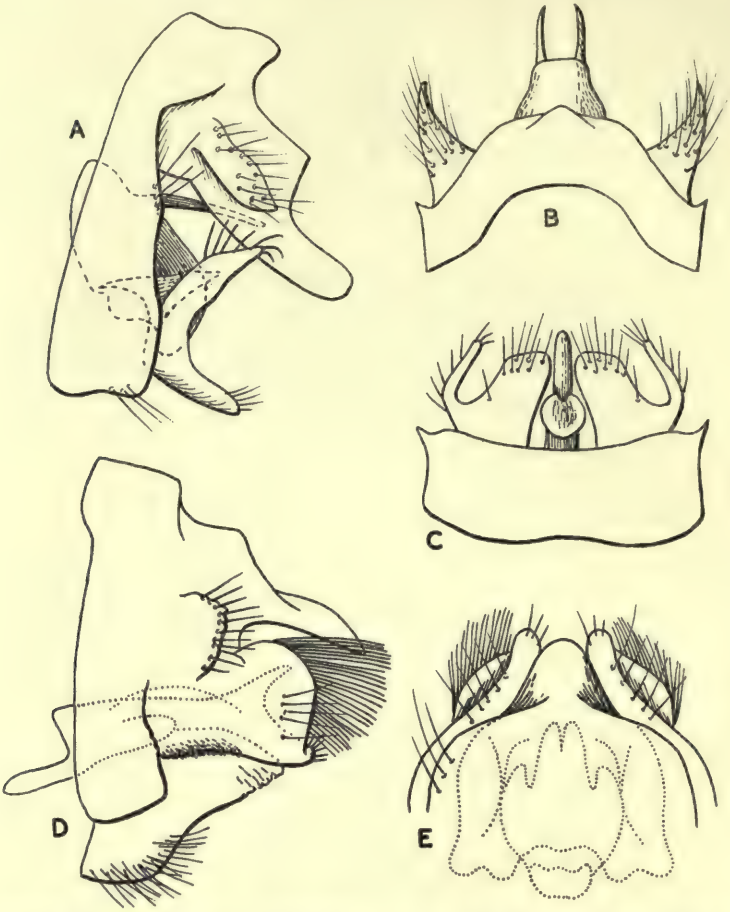

Fig. 25. *Setodes baccata* sp. n. Genitalia. (A), ♂, lateral; (B), ♂, ninth and tenth segments, dorsal; (C), ♂, ninth segment, claspers and aedeagus, ventral; (D), ♀, lateral; (E), ♀, ventral.

Setodes trifida sp. n.

(Text-figs. 24, 26)

KENYA. Nzoia R., Lwamba Ferry, 19–20.iv.1956, 24 ♂, 3 ♀ (*P. S. Corbet*).

(In alcohol). The specimens are much rubbed, but the general colour is ochraceous, eyes reddish black. Antenna rather broadly annulate with fuscous. The fore wing shows traces of fulvous pubescence and a suggestion of numerous hyaline spots Venation much as in *S. squamosa* Mosely, but in the fore wing cells R_2 and $R_5 + M_{1+2}$ with shorter foot-stalks. In hind wing cell $R_5 + M_{1+2}$ nearly as long as its foot-stalk.

♂ GENITALIA. Ninth segment very short, apical dorsal margin slightly produced in a shallow lobe at its centre, ventral margin not produced. Tenth segment fused to ninth, hooded, tapering to a bilobed apex, and with a setiferous wart on each side at base. Aedegus sharply angled downwards, the deflected portion divided into two parallel, narrow lobes. Claspers with their fused bases closing most of the lower half of the ninth segment. From each half of the base arise three distinct branches, the lowest directed tailward, narrow from the side, broader from above, apex narrowed. The median branch is rather foliate, narrow at base and curved inward. From above, its inner margin is serrate and armed with bristles. Between the two median branches are a pair of short, setiferous fingers. The upper branch is long and slender, directed upwards on each side of the tenth segment.

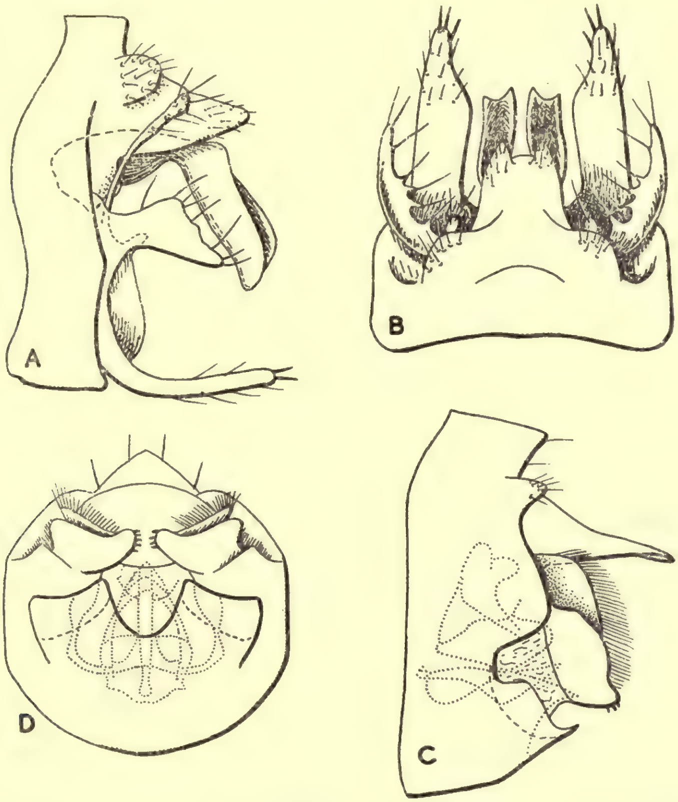

FIG. 26. *Setodes trifida* sp. n. Genitalia. (A), ♂, lateral ; (B), ♂, dorsal ; (C), ♀, lateral ; (D), ♀, ventral.

♀ GENITALIA. Ninth segment forming a complete sclerotized ring. Dorsal apical margin triangularly produced. Tenth segment forming a broad, rounded plate, appearing as a narrow triangular projection in side view. At its base on each side is a small setiferous wart. Ventral margin of ninth segment with a U-shaped excision at its centre, between two triangular lobes. Lateral gonapophyses each in the shape of two overlapping narrow plates, joined at their lower angles, which are spiny. The inner plate is fringed with hairs.

Length of fore wing, ♂, 7·5 mm.

♂ holotype and ♀ allotype in 2% formaldehyde solution, abdomen of latter mounted as microscope preparation, ♂ paratype mounted as microscope preparation, others in 2% formaldehyde solution. The nearest African relative of this species is *S. squamosa* Mosely, from which it differs in the male in having three main branches of the claspers, and in the shorter tenth tergite without long spines. The female differs in the simple tenth tergite, the excised ninth sternite and the different form of the lateral gonapophyses.

Trichosetodes lacustris Kimmins

Trichosetodes lacustris Kimmins, 1953, *Entomologist*, **86** : 278.
Trichosetodes victoriana Kimmins, 1956, *Trans. R. ent. Soc. Lond.* **108** : 139–140 (**Syn. nov.**).

Further material from Jinja, collected by Dr. Corbet, has shown variation in the number of spines on the outer branch of the tenth segment of the male (two, one or none, even differing on opposite sides of the same specimen) and in the degree of production of the inner apical angle of the clasper. The degree of variation brings *T. victoriana* within the limits of *T. lacustris* and *victoriana* must therefore be treated as a synonym.

Family LEPIDOSTOMATIDAE

Pisulia pinheyi sp. n.

(Text-fig. 27)

S. RHODESIA. Chirinda Forest, xi.1955, 1 ♂.

♂ (pinned). Eyes hairy. Head piceous on vertex, with a small ochraceous spot between the basal ocelli, face and palpi ochraceous. Antenna short, piceous. Thorax piceous above, ochraceous laterally and beneath. Legs ochraceous, with fuscous pubescence, inner apical spur of posterior tibia glabrous, slightly curved and acute. Abdomen fuscous, slightly paler beneath, anal appendages dull ochraceous. Wings fuscous, with fuscous pubescence, venation as figured.

♂ GENITALIA. Seventh sternite triangularly produced at its centre, apex rounded. Ninth segment narrowed above and below. Tenth segment divided into a median and two lateral lobes. Lateral lobes each comprising a digitate process, slightly down-curved, arising from a broadened base, which also carries a setiferous wart and another short process. From above, the digitate process is slightly clavate. The median lobe lies at a lower level between the lateral lobes. It is lightly sclerotized, tapering to an apex with a V-shaped excision. Aedeagus short, with an excised apex. Clasper trifid, the upper branch foliate, its outer lateral margin strongly upcurved and covered with long setae, lower margin longitudinally keeled. From above or below it tapers to a rounded apex. Median branch a little lower but about as long as upper branch, narrower in side view and with an acute apex. From beneath, moderately broad at base and apex, slightly constricted mid-way and obliquely rounded at apex. Lower branch not extending as far as other branches, cylindrical and with an apical tuft of long setae.

Length of fore wing, 6·5 mm.

♂ holotype (with one pair of wings mounted dry, abdomen in glycerine) presented by E. Pinhey, Esq., of the National Museum of S. Rhodesia. This species differs from *P. glabra* Marlier in venation and in male genitalia. In the fore wing the discoidal cell is relatively narrower, the thyridial cell more elongate and cell Cu_{1a} narrower. In genitalia the lateral lobes of the tenth segment are narrower and more arched in side view, the upper branch of the clasper is more dilated, the median branch differently formed in ventral view and the lower branch much shorter.

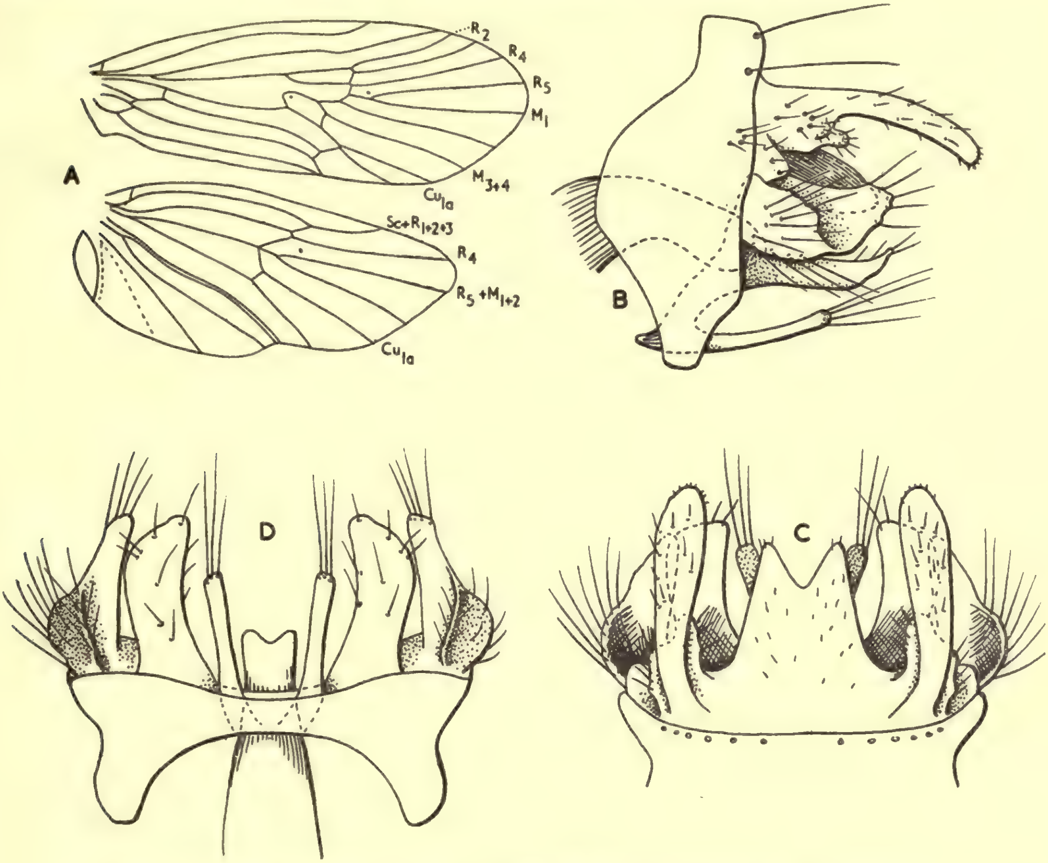

Fig. 27. *Pisulia pinheyi* sp. n. ♂ Wings (A) and genitalia. (B), lateral; (C), dorsal; (D), ventral.

I differ slightly from Dr. Marlier in my interpretation of the wing venation, with the result that I consider the forks to be R_2, R_4, M_1 and Cu_{1a} in the fore wing (forks 1, 2, 3 and 5) and forks R_4 and Cu_{1a} in the hind wing (forks 2 and 5). This difference arises from the probability that the facetic point is always between veins R_4 and R_5, even if this involves the assumption that at times R_5 doubles back and fuses with the anterior branch of M for a greater or lesser distance.

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F. G. A. M. SMIT

BULLETIN OF
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ENTOMOLOGY Vol. 6 No. 2
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BY

F. G. A. M. SMIT Xref.

Pp. 39–76; 75 *Text-figures*

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NATURAL HISTORY

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NEW HYSTRICHOPSYLLID SIPHONAPTERA

By F. G. A. M. SMIT

The new fleas dealt with in this publication all belong to the family Hystrichopsyllidae. A new subfamily with a new genus and a new species is erected; seven new species and one new subspecies of *Rhadinopsylla*, subgenus *Actenophthalmus*, are described, one species of the same subgenus is redescribed and another is recalled from synonymy and attention is drawn to the taxonomic value of the structure of the metathorax in *Rhadinopsylla*.

Holotypes are in the British Museum (Natural History), unless stated otherwise.

Family ***HYSTRICHOPSYLLIDAE***

ACEDESTIINAE subfam. nov.

Separable from any other Hystrichopsyllidae by the oblique genal ctenidium consisting of four pointed spines, and from all except certain genera of Anomiopsyllinae (*Anomiopsyllus, Stenistomera, Eopsylla, Callistopsyllus* and *Megarthroglossus*) by having only one row of setae on the thoracic and abdominal terga (with the partial exception of tergum I in one of the two known representatives).

Club of antenna composed of eight or nine segments. Antennal fossa closed. Eye much reduced or vestigial. Labial palp short, consisting of four or five segments. Central tuber absent. Genal ctenidium oblique. Pronotal ctenidium present. Prosternosome without a sinus for the reception of the first link-plate. One dorsal and one subventral pseudoseta each side under the collar of mesonotum. Inner internal rod of mid and hind coxae short. Inner and outer surfaces of femora without lateral setae. The three nota and terga I (or II) to VII with only one row of setae; anterior terga each with an inconspicuous subdorsal spinelet each side. Sternum VIII of female with an acute ventro-posterior angle and without setae.

The two included genera are both monotypical and only known from the female sex; they occur in Australia where they are the only representatives of the family Hystrichopsyllidae. The simplified structure of these fleas indicates that they are true nest-fleas, as would be suspected from their apparent rarity.

Genus ***ACEDESTIA*** Jordan, 1937

Acedestia. Jordan, 1937, *Novit. zool.* **40** : 312. Type species : *A. chera* Jordan.

Head integricipit, shorter than high. Frontal tubercle small, contained in a pit. No arch of tentorium visible in front of the eye. Maxillary and labial palps short, the latter five-segmented. Eye reduced. Preantennal and postantennal regions of head each with one row of setae. Antennal club consisting of nine segments. Genal ctenidium composed of four sharply pointed spines. Pronotum short ; pronotal ctenidium consisting of sharply pointed spines, the more dorsal of which are far longer than the pronotum. All nota and terga II–VII each with only one row of normal setae, tergum I with an incomplete additional row (as in Pulicidae). Metepimeron extending far dorsad of its spiracular fossa ; metasternum with a squamulum. A subapical patch of small spiniform setae on inner side of hind coxa. Segment V of all tarsi with four lateral pairs of setae, fore and mid tarsi also with a pair on the planta between the members of the first lateral pair. Spiracles of metepimeron and terga II–VII ovate, subacuminate posteriorly. Female with two antesensilial setae ; sensilium extremely slightly convex dorsally, with about 14 trichobothria each side ; anal stylet long and slender, with a long apical seta and two minute subapical ones.

The only known species, *A. chera* Jordan, occurs in West Australia (Mahogany Creek, Perth) and South Australia (Yorke Peninsula),[1] and only two females of it have been obtained. Both were collected from members of the marsupial family Peramelidae (bandicoots).

IDILLA gen. nov.

The following generic description is based on the female sex only. Head markedly fracticipit, longer than high. Frontal tubercle absent. No arch of tentorium in front of the eye, but the basal portion of the tentorial rod present. Maxillary and labial palps short, the latter four-segmented. Eye vestigial. Preantennal region of head with one row of setae and a large additional seta some distance above the eye. Antennal club consisting of eight segments. Postantennal region with one seta obliquely above the antennal scape, the posterior row represented by only one fairly large ventro-marginal seta. Genal ctenidium consisting of four pointed spines. Pronotum very short ; pronotal ctenidium present, its spines much longer than the pronotum. All nota and terga I–VII each with only one row of strongly reduced setae. Metepimeron not extending far dorsad of its spiracular fossa ; metasternum without a squamulum ; no subapical setae on inner side of hind coxa ; segment V of all tarsi with three lateral pairs of plantar setae and one pair on the planta between the members of the first (basal) pair. Spiracles of metepimeron and terga II–VII circular. Two antesensilial setae. Sensilium distinctly convex dorsally. Anal stylet fairly long, with a short apical seta and two minute subapical ones.

Type species : *I. caelebs* sp. n.

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[1] Jordan (1937, *Novit. zool.* **40** : 315) gives the data of the paratype as " Queensland : Yorke Pen., off *Parameles gunnei*."—Yorke Peninsula (not Cape York Peninsula, which is in Queensland) is in South Australia, and the host was presumably misdetermined, since *Perameles gunni* is known only from eastern Victoria and Tasmania. Dr. G. M. Dunnet, of Canberra, very kindly informed me (*a*) that, as far as is known, the collector of the paratype (Professor Wood Jones) never collected on the Cape York Peninsula, and (*b*) that the host will very likely have been *Perameles myosura*, which is the form of *Perameles* occurring in South Australia and west to Western Australia.

Idilla caelebs sp. n.

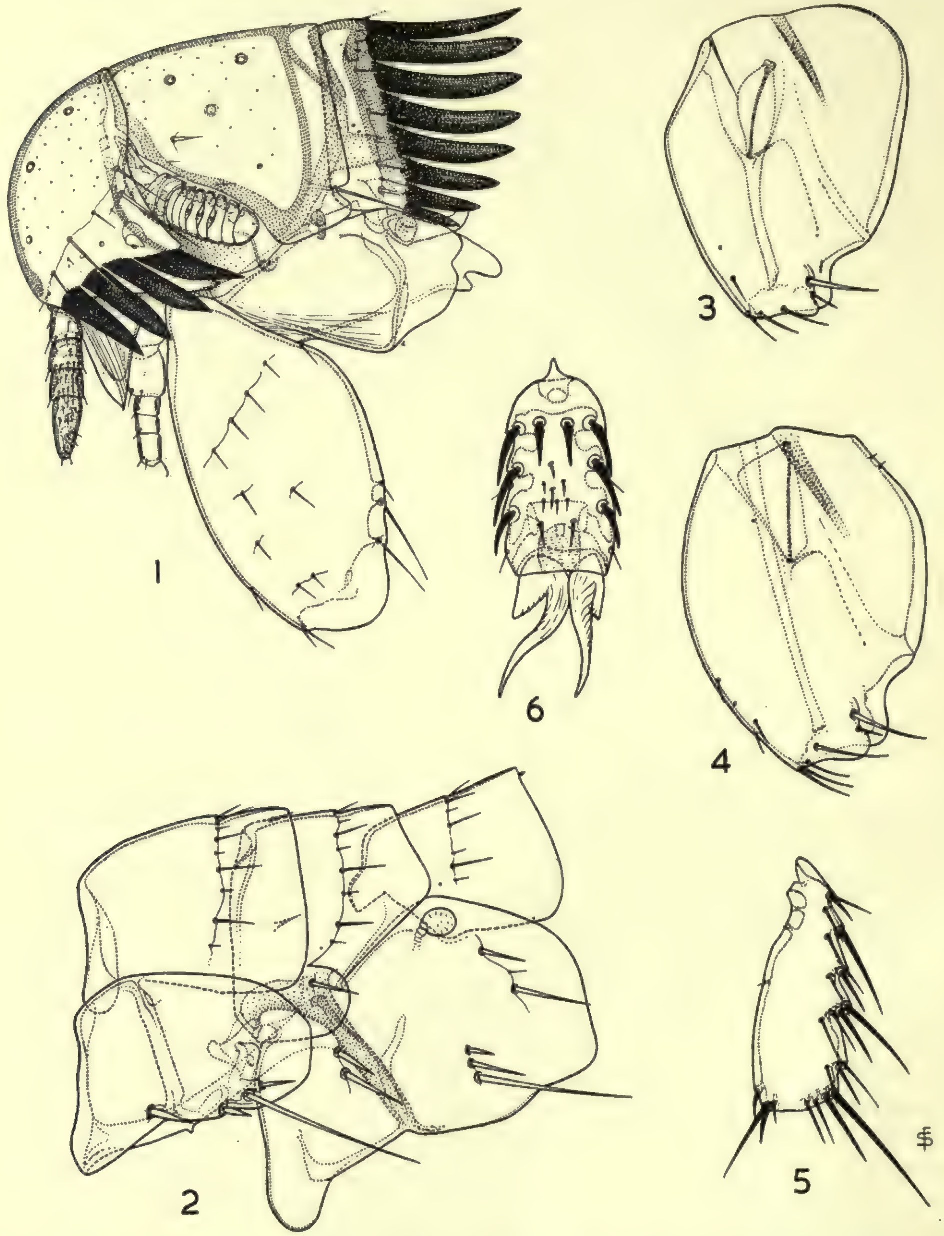
(Text-figs. 1–8)

Type material. Female holotype collected at Colo Vale, near Mittagong, New South Wales, Australia, from *Antechinus flavipes*, on 2.vi.1954, by A. L. Dyce.

Diagnosis. This new species is easily recognizable by the shape of the genal and pronotal ctenidia, the fracticipit head, the absence of a pleural arch of the metathorax, the three lateral pairs and one basal plantar pair of setae on all last tarsal segments and the exceptionally strongly reduced chaetotaxy.

Description. Head (Text-fig. 1). Markedly fracticipit. Frontoclypeal margin smoothly and fairly strongly rounded, without an angle or a frontal tubercle. Oral margin very short. Preoral tuber hardly differentiated from the rest of the frontal incrassation, which is fairly thick and even throughout. Preantennal part of head with one row of four setae, two of which are of moderate length, the other two short and thin ; an additional fairly large seta between the uppermost seta of the row and the vestigial eye. Genal ctenidium oblique, consisting of four sharply pointed spines of which the third is very slightly spatulate. Genal process short, its tip visible below the fourth genal spine. Eye vestigial. Maxillary palp even a little shorter than the labial palp ; the latter consists of only four segments and reaches to about two-fifths the length of the fore coxa. Stipes, laciniae and epipharynx also very short. Antennal club consisting of eight segments, the first two segments apparently being amalgamated ; scape and pedicel each with only one small posterior seta. The tentorial rod is short, only its basal portion being retained, and it does not reach the preantennal part of the head. Interantennal suture and ridge very well developed. Postantennal region of head with only one strongly shortened (hence spiniform in appearance) seta above the antennal pedicel and two minute setae bordering the antennal fossa ; of the usual posterior row of setae only a minute dorsal seta and a normal-sized ventral seta are retained, but the latter seta is most unusually placed, namely marginal and in a small sinus. The true occiput is teat-shaped and extends to the posterior margin of the pronotum.

Thorax (Text-figs. 1, 2). Pronotum very short, with one row of six strongly reduced setae on each side. Pronotal ctenidium consisting of 16 spines which are distinctly curved ; the dorsal spines are more than thrice as long as the pronotum anterior to these spines. Mesonotum with one row of four very small setae each side ; with a dorsal and a subventral short pseudoseta under its collar. Mesepisternum with only one subspiniform ventral seta, mesepimeron with three ventral setae, the first of which is marginal and spiniform, the second very long and the third short. Metanotum also with one row of four strongly reduced setae each side, metepisternum with one short seta, its semicircular posterior margin not connecting up dorsally with the lower end of the ventral margin of the metanotum. Metasternum with two fairly stout and short setae and without a squamulum, metepimeron with two setae obliquely below the rounded spiracular fossa and a vertical subventral row of three setae, the lowest of which is the longest. Pleural arch of metathorax absent ; the furca long and narrow and bent backwards.



FIGS. 1–6. *Idilla caelebs* gen. n., sp. n. (holotype). 1. Head, prothorax and fore coxa. 2. Mesothorax, metathorax and tergum I. 3. Mid coxa. 4. Hind coxa. 5. Hind tibia. 6. Fifth hind tarsal segment.

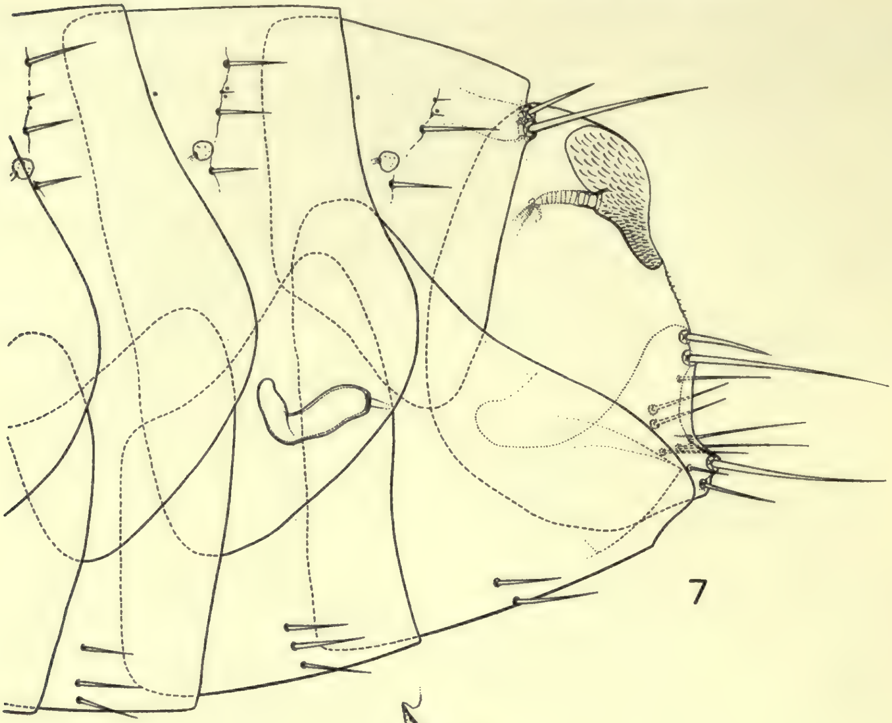
LEGS. Outer surface of the broad fore coxa (Text-fig. 1) with about a dozen very small lateral setae; mid and hind coxae (Text-figs. 3, 4) without lateral setae on either inner or outer side, but with a few short preapical and apical setae. Outer internal ridge of mid and hind coxae somewhat shorter than the inner internal rod. All femora without lateral setae and the outer of the two dorso-apical setae very short, especially on the fore femur. Tibiae without lateral setae on the anterior longitudinal half (Text-fig. 5); fore tibia with five groups of dorso-marginal setae, consisting of 2, 3, 3, 2 and 4 setae respectively, mid tibia with six groups of 2, 2, 2, 3, 2 and 4 setae, and hind tibia (Text-fig. 5) also with six groups, consisting of 2, 2, 2, 4, 2 and 4 setae respectively. Ratio of lengths of tibiae and tarsal segments (petiolate bases omitted):

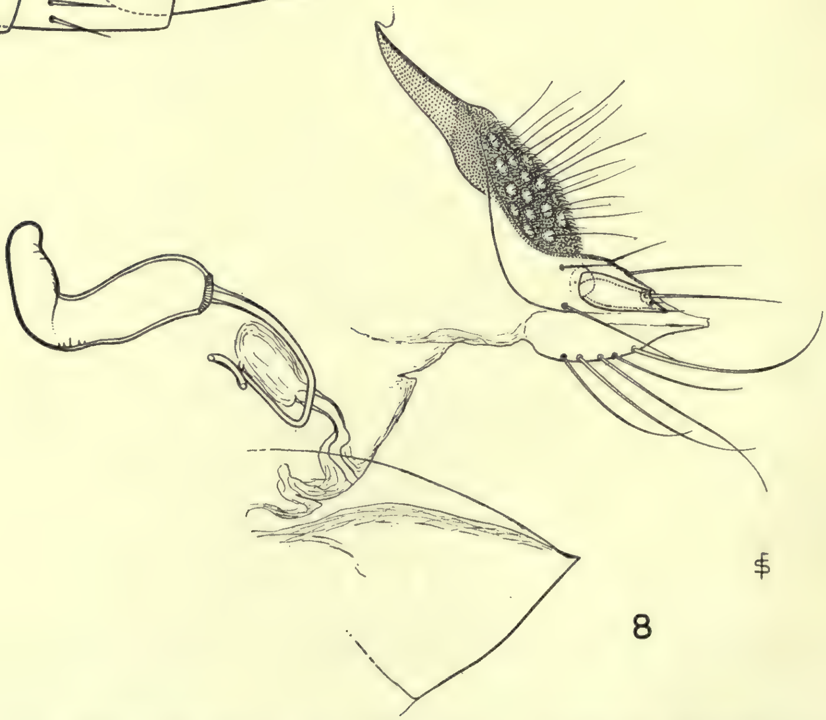
		Tarsal segments				
Leg	Tibia	I	II	III	IV	V
Fore	41	12	13	12	12	28
Mid	57	17	17	15	12	29
Hind	62	34	25	18	14	30

All tarsal setae are rather short and none of the apical setae of the second hind tarsal segment reaches beyond the apex of the third segment. Fifth segment of all tarsi with only three pairs of lateral plantar setae but with a basal plantar pair between the members of the first lateral pair; the two preapical lateral setae very short and on the distal two-thirds of the planta only a few minute setae (Text-fig. 6).

UNMODIFIED ABDOMINAL SEGMENTS (Text-fig. 7, part). Terga I–VII each with only one row of extremely short setae; the rows of the two sides of each tergum do not reach the dorsal margin; on each side of terga I–VI these rows consist of three setae (excluding intercalary setae); tergum VII with only two setae each side. Terga I–III each with one subdorsal small marginal spinelet per side. Female with two antesensilial setae on a very short pedestal, the upper seta two-fifths the length of the lower. Spiracular fossa of terga II–VII rounded and situated a little above the lowest seta of the row. Basal sternum without lateral setae and with only one ventral seta each side; sterna III–VI each with a very short subventral row of three smallish setae per side.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA OF FEMALE (Text-figs. 7, 8). Posterior margin of sternum VII forming a subventral lobe with a convex upper and a short and slightly concave lower margin; with only two setae, one near and one at the ventral margin. Spiracular fossa of tergum VIII large, its dorsal half much wider than the ventral half; posterior margin of tergum VIII with two groups of two setae each; six slender genital setae on the inner side of the apical portion of tergum VIII. Sternum VIII rather high, with an acute ventro-posterior angle and without setae. Sensilium dorsally distinctly convex. Anal stylet nearly thrice as long as its maximum width, with a strongly oblique apex and one fairly long and two minute apical setae. Anal segment pyriform, as in Text-fig. 8, with relatively few but long and slender setae. Spermatheca with a narrow bulga and a shorter and narrower hilla; there are only a few indications of some ventral internal striae





Figs. 7, 8. *Idilla caelebs* gen. n., sp. n. (holotype). 7. Abdominal segments V–VIII and spermatheca. 8. Sensilium, anal segment, sternum VIII and genitalia.

at the place where the bulga merges into the hilla. Ductus spermathecae and ductus bursae rather short; the bursa copulatrix is poorly preserved and the junction of the ductus spermathecae with the bursa is invisible; there is no trace of a ductus obturatus.

LENGTH. ♀ 1¼ mm.

REMARK. After the figures had been drawn the specimen was remounted in order to make certain details more clearly visible. As a result the position of certain structures, e.g. the mouthparts, prosternosome and fore coxa are now slightly different from those shown in the figures.

Subfamily ***RHADINOPSYLLINAE***

Rhadinopsylla (Actenophthalmus) mesoides sp. n.

(Text-figs. 9, 11, 13)

Rhadinopsylla " *mesa* Jord." Jordan, 1938, *Novit. zool.* **41** : 110.

TYPE MATERIAL. Male holotype from near the Gave [= mountain stream] d'Ossone, above Gavarnie, Hautes-Pyrénées, France, 1460 m., *Talpa europaea* [accidentally; true host *Pitymys savii pyrenaicus*], 13.vii.1936, K. Jordan.[1]

DIAGNOSIS. The new species is related to *Rhadinopsylla* (*Actenophthalmus*) *mesa* Jordan & Rothschild, but readily distinguishable from the latter by having five narrow genal spines instead of six broader ones. The movable process of the clasper is also much narrower in the new species.

DESCRIPTION. HEAD (Text-fig. 9). Frontal tubercle well developed. Submarginal frontal row with six setae; in *R. mesa* (Text-fig. 10) this number varies from five to six. Between this row and the genal ctenidium two long setae and several scattered minute setae. Genal ctenidium of five narrow sharply-pointed spines, the uppermost of which reaches to about three-fifths the dorsal length of its neighbour. In *R. mesa* this ctenidium consists of six (in two of the 11 specimens examined there are five spines on one side of the head) much broader and blunter spines, and the uppermost is basally distinctly broader than its neighbour. The five-segmented labial palp does not quite reach the apex of the fore coxa.

THORAX. Pronotum ventrally nearly twice as long as dorsally, with a main row of five setae per side, the lower of which being situated anterior to the midline of the notum (Text-fig. 9); in *R. mesa* the pronotum is ventrally less long. Pronotal ctenidium with 21 spines, the more ventral of which decrease progressively and considerably in size; in *R. mesa* the number of pronotal spines, which are blunter, varies from 21–22, only in one male the number is 20. Mesonotum with a main row of five setae each side, mesosternosome with four setae; metanotum with a main row of five setae per side, metepisternum with three setae, metasternum with one and metepimeron with five setae. Metathorax as in *R. mesa* (Text-fig. 66), with a long suture along the dorso-anterior margin of the metepimeron extending downwards to about the middle of the metepisternum.

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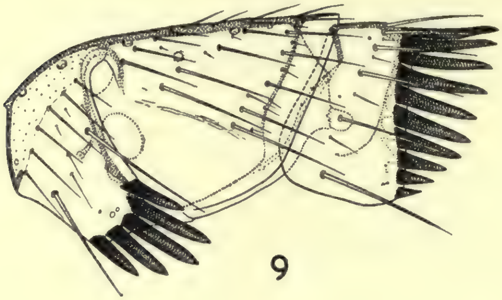
[1] The specimen was obtained on a mole, but this is almost certainly accidental. Jordan (1938 : 108) records obtaining *Pitymys savii pyrenaicus* at the same place and altitude and notes that one of them was trapped in a mole-run. There can be but little doubt that the *Pitymys* is the true host.

Legs. Hind tibia without setae on the inner side. Longest apical seta of the second hind tarsal segment not quite reaching to the apex of the third segment (in *R. mesa* well beyond this apex). Fifth segment of all tarsi with four pairs of lateral plantar setae.



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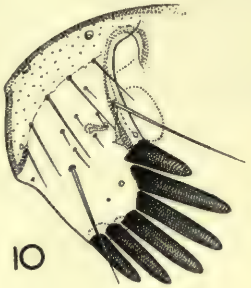

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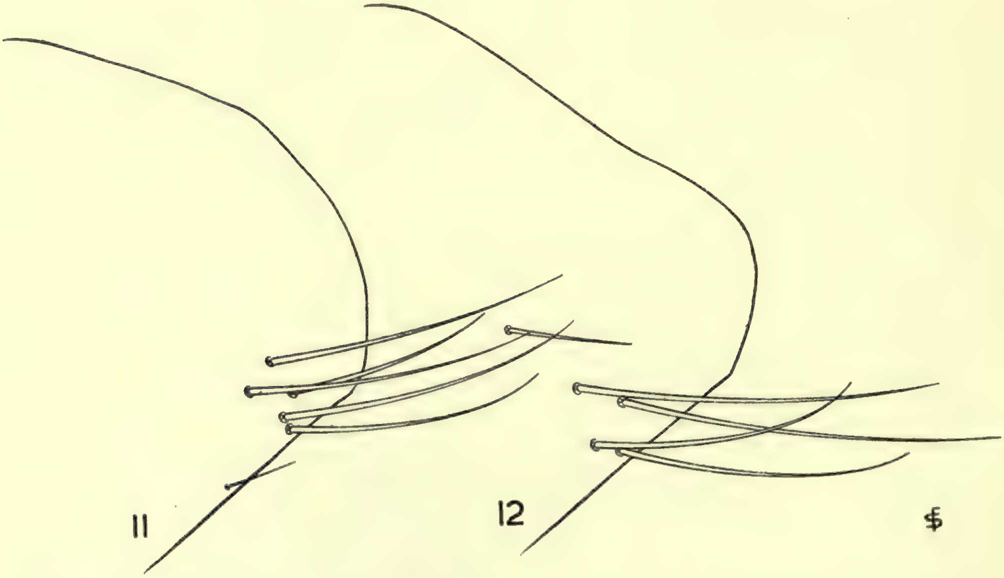


Figs. 9, 11. *Rhadinopsylla* (*Actenophthalmus*) *mesoides* sp. n. (holotype). 9. Head and prothorax. 11. Sternum VIII. Figs. 10, 12. *Rhadinopsylla* (*Actenophthalmus*) *mesa* J. & R. (Steingletscher, B.O., Switzerland). 10. Preantennal part of head, ♂. 12. Sternum VIII, ♂.

Unmodified abdominal segments. Numbers of setae per side in the main row of terga I–VII : 4, 6, 6, 6, 6, 6, 5 ; only one seta below the spiracle on terga III–VI. Numbers of spinelets at each side of the posterior margin of terga I–VI : 2, 3, 3, 2

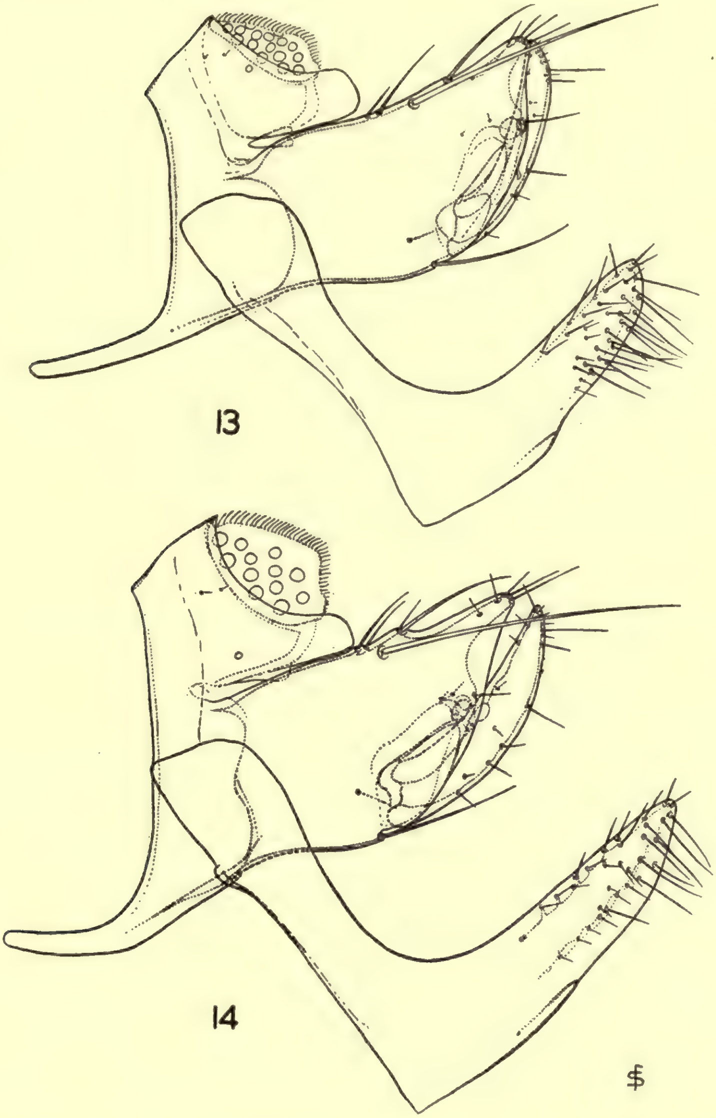


FIG. 13. *Rhadinopsylla* (*Actenophthalmus*) *mesoides* sp. n. (holotype). Clasper and sternum IX. Fig. 14. *Rhadinopsylla* (*Actenophthalmus*) *mesa* J. & R. (Steingletscher, B.O., Switzerland). Clasper and sternum IX.

or 3, 1 or 2, 1. Numbers of setae per side on sterna II–VII: 0, 3 or 4, 3, 3, 3, 2 or 3.

MODIFIED ABDOMINAL SEGMENTS AND GENITALIA OF MALE (Text-figs. 11, 13). Tergum VIII without setae. Posterior margin of sternum VIII broadly but not very strongly rounded (Text-fig. 11); in *R. mesa* (Text-fig. 12) this margin forms a more distinct bulge and in the latter species the setae are placed farther away from the posterior margin. Clasper (Text-fig. 13), measured from tip of manubrium to apex of fixed process, about two and a half times as long as the movable process; fixed process of clasper with a less acute dorso-posterior angle than in *R. mesa* (Text-fig. 13, cf. Text-fig. 14), and the manubrium is markedly longer than in the latter species; the acetabular seta is placed below the lower end of the movable process. Movable process narrow, of equal width from base to near apex, only slightly curved; the fovea is situated a little above the middle of the anterior margin, in *R. mesa* a little below the middle. Distal arm of sternum IX (Text-fig. 13) more or less as that of *R. mesa* (Text-fig. 14), but relatively shorter and more setose. Sensilium with 12 trichobothria each side; this is also the usual number in *R. mesa*. The phallosome, which is so inconveniently uniform in the genus, does not differ much from that of *R. mesa*; only its overall length is less than that of *R. mesa* and the dorsal wall of the aedeagal inner tube is thinner.

LENGTH. ♂ nearly 2½ mm. (*R. mesa* ♂ 2–2¾ mm.).

Rhadinopsylla (Actenophthalmus) isacantha continentalis subsp. n.

(Text-figs. 15, 68)

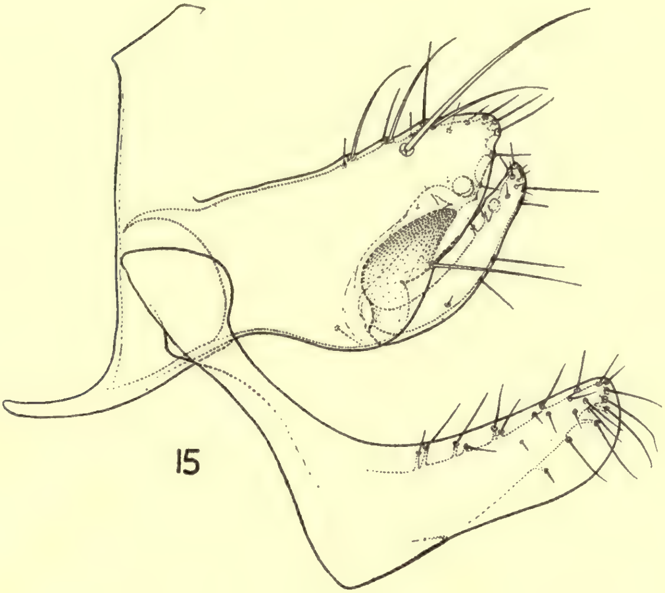
Rectofrontia isacanthus Roths. Smit, 1950, *Ent. Ber.* **13**: 63, fig. 1.

Rhadinopsylla (*Actenophthalmus*) *isacanthus* (Rothschild) (part). Smit, 1954, *Danm. Fauna*, **60**: 50, figs. 46, 53, 54; Smit, 1957, *Handb. Ident. Brit. Ins.* **1** (16): 34, 35, figs. 55, 62, 63. The figure of the clasper in these two publications were made from a specimen from Buré d'Orval, France (now a paratype of *R.* (*A.*) *i. continentalis*) and those of the head and segment VII of the female from a specimen from Wageningen, Netherlands, since until a recent donation by Mr. R. B. Freeman there were only a few specimens from England in the Tring collection and these were not well mounted and not ideal for drawing purposes.

Rhadinopsylla (*Actenophthalmus*) *isacantha* (Rothschild). Smit, 1957, *Ann. Mag. nat. Hist.* (12) **10**: fig. 11.

TYPE MATERIAL. Male holotype, female allotype and 4 ♂, 8 ♀ paratypes from Buré d'Orval, Meurthe-et-Moselle, France, from nests of *Clethrionomys glareolus* (except for 1 ♀ collected off a specimen of *C. glareolus*, and 3 ♀ from "nest of mice"), holotype and allotype collected on 3.i.1934, paratypes: 1 ♂, 1 ♀, 2.i.1934; 1 ♂, 2 ♀, 3.i.1934; 1♀, 6.i.1934; 1 ♂, 1 ♀, 31.i.1934; 3 ♀, 29.iii.1934; 1 ♂ 14.iv.1934; all collected by H. Heim de Balzac.

DESCRIPTION. The new species only differs in the male from the nominate form, which is only known from England, by having a much shorter movable process of the clasper which consequently does not reach the apex of the fixed process, and by the distal arm of sternum IX being relatively slightly narrower (Text-fig. 15, cf. Text-fig. 16).



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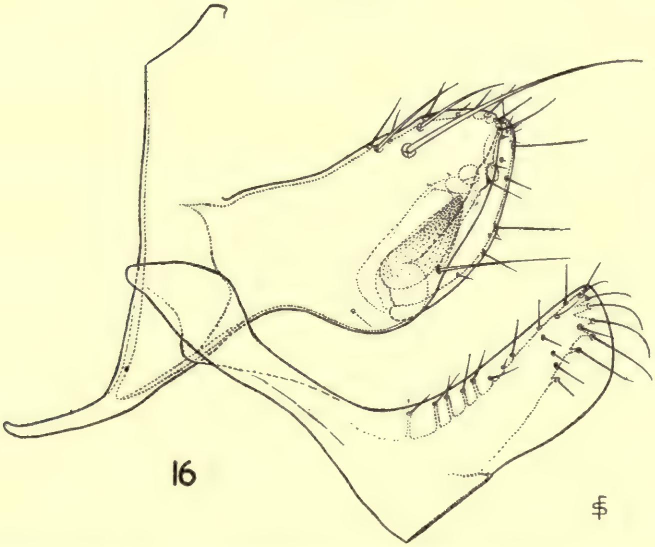

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Fig. 15. *Rhadinopsylla* (*Actenophthalmus*) *isacantha continentalis* ssp. n. (holotype). Clasper and sternum IX. Fig. 16. *Rhadinopsylla* (*Actenophthalmus*) *isacantha isacantha* (Rothschild) (Compton, Berkshire, England). Clasper and sternum IX.

LENGTH. ♂ 2–2½ mm., ♀ 2¼–2¾ mm. (same as nominate subspecies).

REMARKS. Text-fig. 16 was drawn from a specimen which had hardly been cleared or flattened; Text-fig. 17 represents the clasper of the same specimen, but after treatment with caustic potash and consequent greater flattening—in this remounted specimen the movable process appears to be shorter than it was before, but this is only due to a slight moving downwards of the process; also the position of the acetabular portion of the movable process has changed in relation to the main part of the process. This illustrates clearly the desirability always to clear and mount fleas in a similar way, and when observing minor discrepancies between uncleared mounted and cleared mounted fleas of a certain form one should bear in mind that the differences may be more apparent than real.

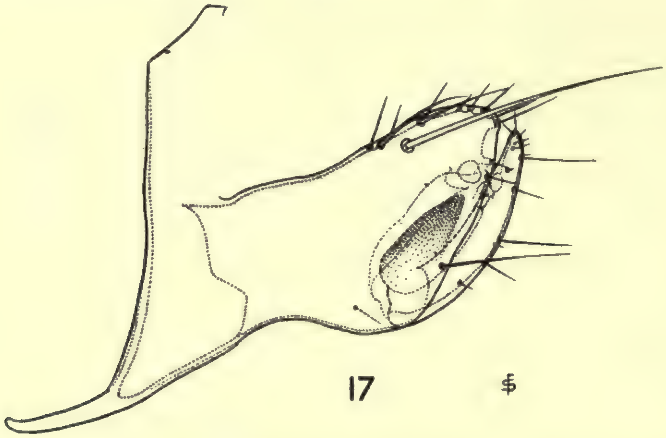


FIG. 17. *Rhadinopsylla* (*Actenophthalmus*) *isacantha isacantha* (Rothschild) (Compton, Berkshire, England). Clasper.

The great rarity of this winter flea of voles is evident from the fact that the Tring collection contains only the type series of the new subspecies, and a sole female from The Netherlands, while Professor F. Peus informs me that he has not yet succeeded in collecting *R. isacantha* in Germany; of the nominate subspecies there are only 12 specimens in the Tring collection.

Rhadinopsylla (Actenophthalmus) strouhali sp. n.

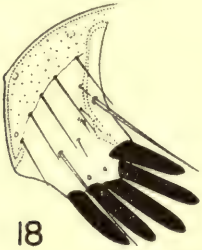
(Text-figs. 18, 20, 21)

Rhadinopsylla (*Rectofrontia*) "*isacanthus* Roths." Wagner, 1936, *Konowia*, **15** : 98, 101.
Rhadinopsylla (*Actenophthalmus*) "*isacantha* (Rothschild)". Smit, 1955, *Cat. Faun. Austr.* XIXz : 2.

TYPE MATERIAL. Male holotype from Moosbrunn, Lower Austria, from a nest of *Talpa europaea*, 1.iii.1927, M. Beier and H. Strouhal; in the Naturhistorisches Museum in Vienna.

DIAGNOSIS. The new species appears to be related to *R. isacantha* and differs from the latter by having a broader uppermost spine of the genal ctenidium, a shorter clasper and a truncate apex of the distal arm of sternum IX of the male. Female as yet unknown.

DESCRIPTION. The uppermost of the five genal spines is distinctly broader than its neighbour and its apex reaches to about two-thirds the length of the latter spine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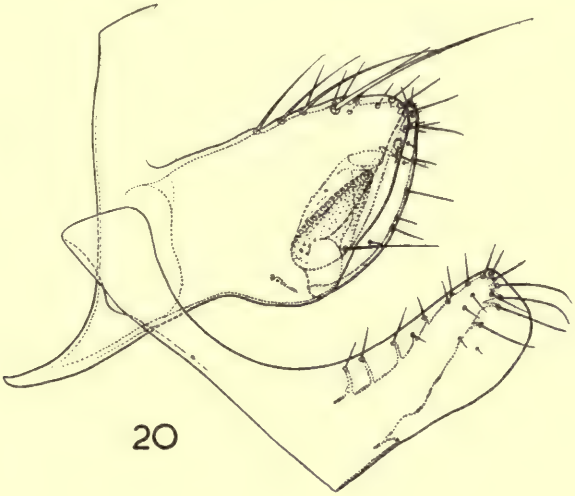
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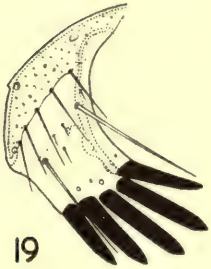
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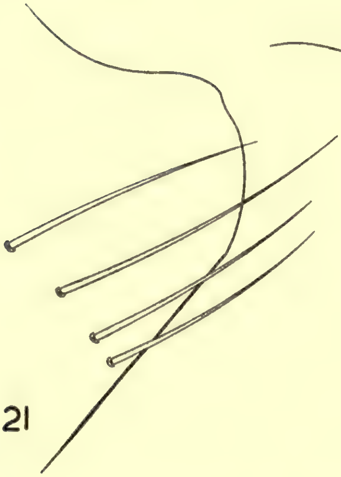
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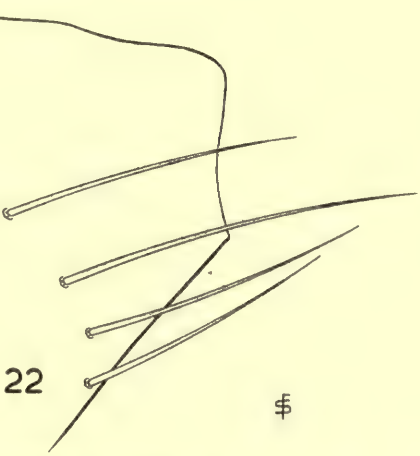
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FIGS. 18, 20, 21. *Rhadinopsylla* (*Actenophthalmus*) *strouhali* sp. n. (holotype). 18. Preantennal part of head. 20, Clasper and sternum IX. 21. Sternum VIII. Figs. 19, 22. *Rhadinopsylla* (*Actenophthalmus*) *isacantha isacantha* (Rothschild), ♂ (Compton, Berkshire, England). 19. Preantennal part of head. 22. Sternum VIII.

(Text-fig. 18, cf. Text-fig. 19). The five-segmented labial palp is rather short and reaches to about two-thirds the length of the fore coxa. Pronotal ctenidium consisting of 23 spines. Metathorax virtually the same as that of *R. isacantha* (see Text-fig. 68). One seta on the inner side of the hind tibia. The longest apical spine of the second hind tarsal segment reaches to about the apex of the third segment. Last tarsal segment of all legs with four pairs of lateral plantar setae. Only one seta below the spiracle on terga III–VI. Number of marginal spinelets per side on terga I–VI, ♂: 3 or 4, 3 or 4, 4, 3, 2 or 3, 1 or 3 respectively. Sensilium with 12 trichobothria each side.

Modified abdominal segments of male (Text-figs. 20, 21). Tergum VIII without setae. The row of four strong setae on sternum VIII (Text-fig. 21) is placed rather distantly from the convex posterior margin; in *R. isacantha* the posterior margin of sternum VIII below the angle is concave (Text-fig. 22). Clasper (Text-fig. 20, cf. Text-figs. 15, 16), measured from tip of manubrium to apex of fixed process, a little over twice as long as the movable process. Fovea of movable process situated in the apical portion of the process. Manubrium rather short. Acetabular seta placed well above the ventro-posterior angle of the clasper. Distal arm of sternum IX (Text-fig. 20, cf. Text-figs. 15, 16) about thrice as long as broad, with a markedly truncate apical margin which meets the dorsal margin at about a right angle; the distal arm bears relatively few setae.

LENGTH. ♂ 1½ mm.

REMARKS. The occurrence of the specimen described above in the nest of *Talpa europaea* is doubtless accidental; the true host is presumably a microtine rodent.

I have pleasure in naming this new species after Professor H. Strouhal, Director of the Naturhistorisches Museum in Vienna, whose unstinted efforts in obtaining material of fleas for the preparation of the flea-list in the *Catalogus Faunae Austriae* greatly increased our knowledge of the flea-fauna of his country, and who was one of the two collectors of the holotype.

Rhadinopsylla (Actenophthalmus) pitymydis (Zavattari), 1914 (species revocata)

Neopsylla pitymydis. Zavattari, 1914, *Ann. Mus. civ. Stor. nat. Genova*, **46**: 144, fig. (Cascinelle, Borzoli, Liguria, from *Pitymys savii* and *Pitymys subterraneus multiplex*).

Neopsylla pitymydis Zavattari. Jordan, 1921, *Ectoparasites*, **1**: 141 (considered a synonym of *Rhadinopsylla isacanthus*).

Since I found that records of *R. isacantha* from Austria and Yugoslavia refer to misdetermined specimens of respectively *R. strouhali* and *R. dolomydis*, and that *R. isacantha* proved to consist of two subspecies which are only known from England, Holland and northern France, the suggested synonymy of *R. pitymydis* with *R. isacantha* is now very doubtful, and I regard *R. pitymydis* as a good species. Dr. C. Conci, of Genoa, very kindly searched for the 1 ♂ 1 ♀ syntypes (no other specimens being known) of Zavattari's species, but unfortunately they appear to have been lost. Zavattari's description and figure are very unsatisfactory, but the drawing shows a definite widening of the apex of the distal arm of sternum

IX; in *R. isacantha* this apex is never widened. Jordan (1921) examined the male syntype of *pitymydis* and commented on the greater width of the apex of sternum IX as compared with British specimens of *R. isacantha*. Zavattari's figure shows that the body of the clasper of *R. pitymydis* is broader and blunter than that of *R. isacantha*, but the drawing is very sketchy and may not be wholly correct; Jordan did not remark on any differences in the clasper.

Rhadinopsylla (Actenophthalmus) orama sp. n.

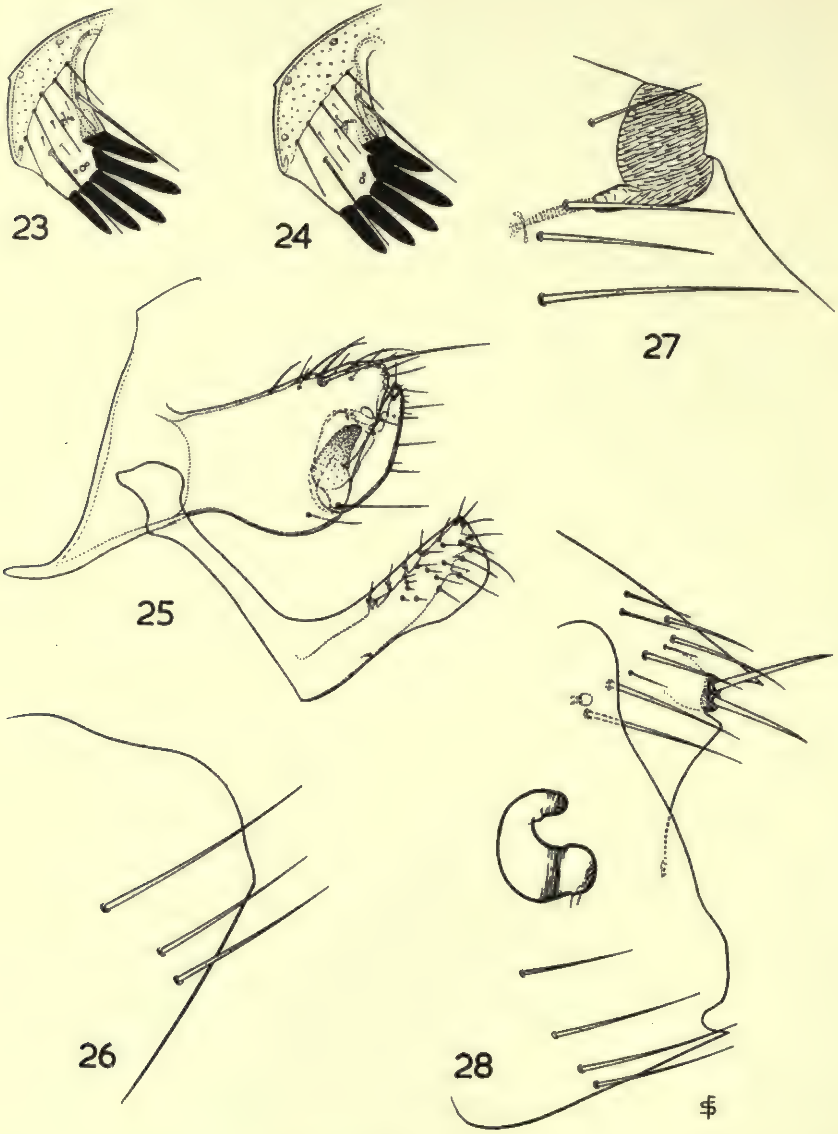
(Text-figs. 23–28, 75)

Rectofrontia "*fraterna* (Baker)". Fox, 1940, *Fleas eastern United States:* 38, 39, Pl. X, fig. 47 (*Kensington, Maryland*).

Material examined. From the collection of Lt.-Col. R. Traub: Male holotype and female allotype, Jonesville area, Lee Co., Virginia, U.S.A., from a nest of *Microtus pennsylvanicus*, 25.xii.1947, D. W. Pfitzer; 1 ♀ paratype, Covington, Virginia, from nest of *Neotoma magister*, 14.xi.1951, V. J. Tipton and J. J. O'Keefe (this specimen has been kindly presented by Lt.-Col. Traub to the Tring collection); 1 ♀ paratype, Giant City State Park, Illinois, from debris, 6.iii.1945, H. Ross and M. Sanderson. From the U.S. National Museum collection: 1 ♂ paratype, Kensington, Maryland, from *Microtus pennsylvanicus*, 22.ii.1924, H. S. Barber; 1 ♀ paratype Glen Mills, Delaware Co., Pennsylvania, from *Blarina brevicauda talpoides*, 28.i.1948, F. Harper; 1 ♂ paratype, U. T. farm, deciduous wood near orchard, Knox Co., Tennessee, 7.iii.1947, *Pitymys pinetorum*, D. W. Pfitzer (this specimen has been donated to the Tring collection by the U.S.N.M.). On Lt.-Col. Traub's request the holotype and allotype have been deposited in the U.S. National Museum collection, Washington D.C.

Diagnosis. The new species is easily distinguishable, apart from the small size, from other North American representatives of the genus in the male by the distinct widening of the apical half of the distal arm of sternum IX, and in the female by the shape and striation of the spermatheca and the presence of one or two strong setae anterior to the widened part of the spiracular fossa of tergum VIII. The structure of the metathorax also forms a useful diagnostic character, and the number of marginal spinelets on terga I–VI is greater than in related North American species.

Description. Genal ctenidium normally consisting of five spines (in one male and one female there are only four spines on one side of the head), the uppermost of which is basally not very much broader than the neighbouring spine and its tip reaches to two-thirds the length of the latter spine (Text-figs. 23, 24). The five-segmented labial palp reaches to about four-fifths the length of the fore coxa. Pronotal ctenidium usually consisting of 20 or 21 relatively short spines (in one female 22, in another 24 spines). Metanotum without a vertical sclerotized ridge underlying the main row of setae and with a very short pale suture between the ventral margin of the collar and the dorso-anterior margin of the metepimeron (Text-fig. 75). There are no setae on the inner side of the hind tibia. The longest apical seta of the second hind tarsal segment reaches at most to the middle of the



FIGS. 23–28. *Rhadinopsylla* (*Actenophthalmus*) *orama* sp. n. 23. Preantennal part of head (holotype). 24. Preantennal part of head (allotype). 25. Clasper and sternum IX (holotype). 26. Sternum VIII (holotype). 27. Dorsal part of tergum VIII, ♀ (paratype, Illinois). 28. Segment VII and spermatheca (allotype).

fourth segment. Last tarsal segment of all legs with four pairs of lateral plantar setae. Only one seta below the spiracular fossa on terga III–VI. Number of marginal spinelets on terga I–VI, ♂ : 3 (4), 4 (5), 3 or 4, 2 or 3, 2 or 3, 2 or 3 ; ♀ : 3 (2), 4 (2), 3 or 4, 2 or 3, 2, 1 or 2. Sensilium with 12 trichobothria each side.

MALE. Tergum VIII without setae. Sternum VIII (Text-fig. 26) with a rounded posterior margin and only three setae each side ; these setae are situated quite distantly from the posterior margin. Clasper (Text-fig. 25), measured from tip of manubrium to apex of fixed process, thrice as long as the movable process. The faintly marked angle in the anterior margin of the movable process (at level with the most ventral point of the fovea) is situated at three-sevenths the length from the apex of the movable process. One fairly long acetabular seta at level of, or a little above, the ventral end of the movable process. Distal arm of sternum IX (Text-fig. 25) markedly widened in its apical half, its setae not very long ; the apical margin forms a right angle with the dorsal margin of the arm.

FEMALE. Posterior margin of tergum VII as in Text-fig. 28 ; posterior margin of sternum VII with a rather small subventral sinus, above which a broadly rounded lobe ; the sternum with a row of only 3 or 4 setae per side (Text-fig. 28). Tergum VIII (Text-fig. 27) with a row of 2 or 3 setae below the large spiracular fossa, and one or two in front of the fossa ; the latter is large but its tubular part is short (Text-fig. 27). Anal stylet about four times as long as its maximum width. Ductus bursae a little shorter than the fifth (uppermost) genal spine. Spermatheca with a wide bulga and only a rather narrow band of internal striations (Text-fig. 28).

LENGTH. ♂ 1½ mm., ♀ 1½–2 mm.

REMARK. This species appears to be a winter flea and restricted geographically to the eastern United States ; microtine rodents are very likely the true hosts.

Rhadinopsylla (Actenophthalmus) fraterna (Baker), 1895

(Text-figs. 29–33, 48, 60)

Typhlopsylla fraterna. Baker, 1895, *Canad. Ent.* **27** : 189, 190 (Brookings, South Dakota, host not recorded).

Ctenophthalmus fraternus Baker. Baker, 1904, *Proc. U.S. nat. Mus.* **27** : 420, 423, 450.

Typhlopsylla fraterna Baker. Rothschild, 1913, *Entomologist*, **46** : 297 (referred to *Rhadinopsylla*).

Neopsylla hamiltoni. Dunn, 1923, *in* Dunn & Parker, *Publ. Hlth Rep., Wash.* **38** : 2770, 2775 (Spoon Creek, southwest of Darby, Montana, from *Neotoma cinerea*).

Rhadinopsylla fraternus Baker. Jordan, 1929, *Novit. zool.* **35** : 184.

Rectofrontia fraternus Bak. Wagner, 1936, *Canad. Ent.* **68** : 203.

Rectofrontia fraterna Baker. Jordan, 1937, *Novit. zool.* **40** : 270 (*N. hamiltoni* placed as a synonym).

Rectofrontia fraterna (Baker). Ewing & Fox, 1943, (part) *Misc. Publ. U.S. Dep. Agric.* (500) : 80, fig. 9D.

Rectofrontia fraterna (Baker). Hubbard, 1947, (part) *Fleas western N. America* : 355, fig. 218.

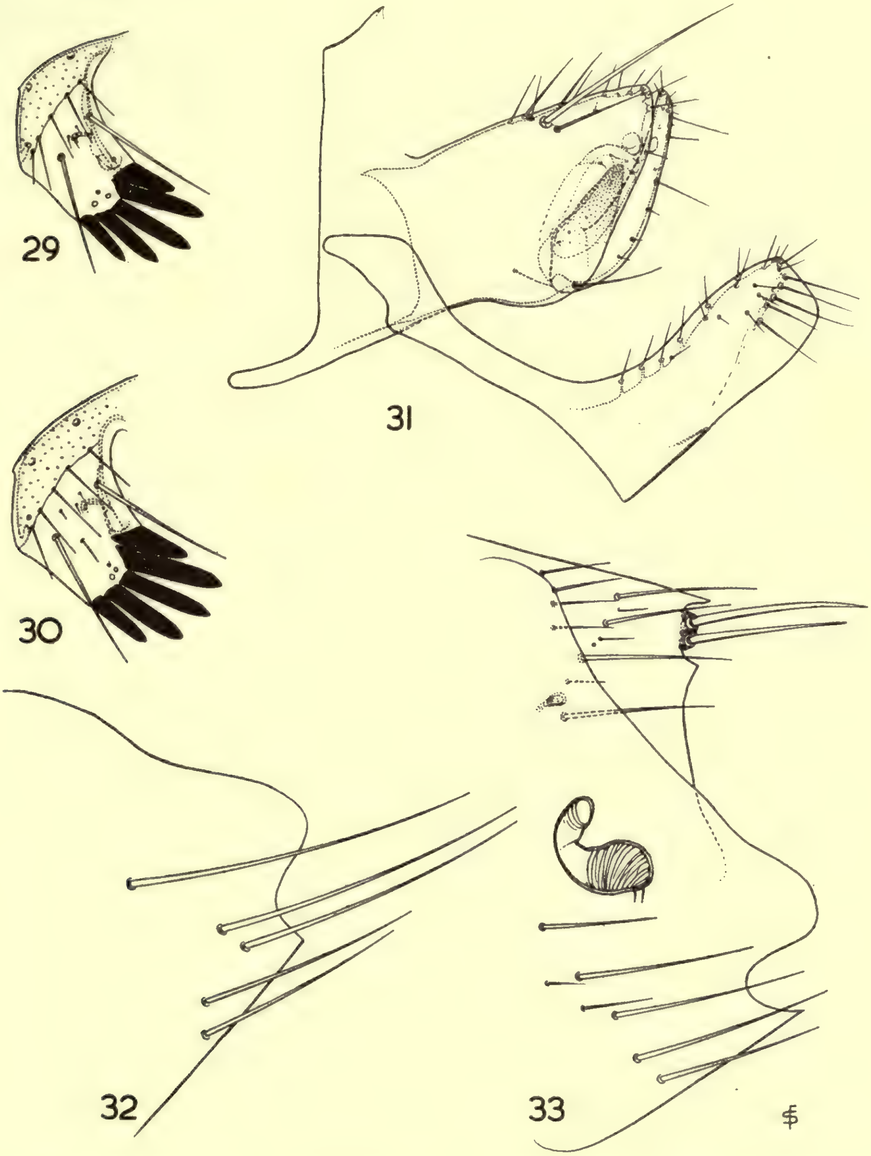
Rectofrontia fraterna (Baker). Holland, 1949, (part) *Siphonaptera of Canada* : 91, figs. 97–99, map 11.

Rhadinopsylla (*Rectofrontia*) *fraterna* (Baker). Morlan & Prince, 1955, *Texas Rep. Biol. Med.* **12** : 1045, fig. 3.

Material examined. From the collection of the U.S. National Museum: 1 ♂, Grand Forks, North Dakota, from *Citellus* sp., 20.v.1937, J. M. Davis; 1 ♀, Kremling, Colorado, from Wyoming ground squirrel (= *Citellus richardsoni elegans*), 13.iv.1939, N. B. Migutoff; 1 ♂, Hanna, Alberta, Canada, from *Citellus richardsoni*, 1.vi.1939, G. P. Holland; 1 ♀, High River, Alberta, from *Citellus richardsoni*, 28.viii.1938, G. P. Holland.—From the collection of the Tring Museum: 1 ♂, Ravalli Co., Montana, from *Neotoma cinerea*, 10.iii.1934, R. R. Parker; 1 ♀, Ravalli Co., Montana, from *Citellus columbianus*, 23.vi.1932, R. R. Parker; 6 ♂, 6 ♀, Calgary, Alberta, Canada, from *Citellus richardsoni*, 12.iv.1901, G. F. Dippie; 1 ♀, Calgary, Alberta, from *Mustela frenata longicauda*, 12.iv.1901, G. F. Dippie; 2 ♂, 8♀, Calgary, Alberta, from *Citellus richardsoni*, 11.iv.1907, G. F. Dippie; 1 ♀, Calgary, Alberta, from *Citellus richardsoni*, 17.iv.1907, G. F. Dippie; 2 ♂, 2 ♀, Calgary, Alberta, from *Mustela frenata longicauda*, 1910, G. F. Dippie; 2 ♂, 2 ♀, Calgary, Alberta, from *Mustela* sp., 20.viii.1913, Mackay and G. F. Dippie: 2 ♂, 3 ♀, Alberta, from *Mustela frenata longicauda*, 21.ix.1900, G. F. Dippie; 1 ♂, Alberta, from *Thomomys* sp., 1906, A. D. Gregson; 1 ♀, Alberta, from *Mustela* sp.; 1 ♀, Canadian National Park, Alberta, from *Ochotona princeps*, 26.viii.1899, G. F. Dippie; 2 ♂, 2 ♀, Blackfalds, Alberta, from *Thomomys* sp., 1910, A. D. Gregson; 1 ♀, Red Deer, Alberta, from Microtus drummondi, G. F. Dippie; 1 ♀, Park Co., Wyoming, from *Cynomys leucurus*, 20.vii.1940; 1 ♀, Jackson Co., Colorado, from *Cynomys leucurus*, 20.vii.1940; 1 ♀, Jackson Co., Colorado, from *Cynomys leucurus*, 15.vii.1937, F. M. Prince.

Diagnosis. The male differs from related North American species by having a seta on tergum VIII and by details of the modified segments; both sexes usually possess two setae below the spiracle on several terga, while the other species described here have only one such seta. The female may be distinguished from that of other North American species by the fairly small size of the expanded part and of the tubular portion of the spiracular fossa of tergum VIII.

Redescription. Genal ctenidium (Text-figs. 29, 30) consisting of five (occasionally six) spines, the upper of which is basally much broader than the lower four and reaches to about two-thirds the length of its neighbour. The five-segmented labial palp does not quite reach the apex of the fore coxa. The number of spines in the pronotal ctenidium varies from 21 to 27, the usual number being 24. Metanotum with a dorsal remnant of the vertical sclerotized ridge; the suture between the ventral margin of the collar and the dorso-anterior margin of the metepimeron is fairly long (Text-fig. 60). Usually two setae on the inner side of the hind tibia. The apex of the longest apical seta of the second hind tarsal segment does not reach the apex of the fourth segment, but usually to about the middle of the fourth segment or a little beyond. Fifth segment of all tarsi with four pairs of lateral plantar setae. Usually two setae below the spiracular fossa on terga III–VI in either sex. Number of marginal spinelets on terga I–VI, ♂: 3 (2–4), 2 or 3 (1–4), 2 (1–4), 2 (1–3), 1 or 2 (3), 0 (1); ♀: 3 (2–4), 2 or 3 (1–4), 2 (1), 1 or 2, 1, 0 (1) respectively. The upper of the two antesensilials in the female is a little longer than the lower; the margin of tergum VII below these setae forms about a right angle (Text-fig. 33). Sensilium apparently with 14 trichobothria each side in both sexes.



Figs 29–33. *Rhadinopsylla* (*Actenophthalmus*) *fraterna* (Baker) (Ravalli Co., Montana). 29. Preantennal part of head, ♂. 30. Preantennal part of head, ♀. 31. Clasper and sternum IX. 32. Sternum VIII. 33. Abdominal segment VII and spermatheca.

Male (Text-figs. 31, 32). Tergum VIII normally with one longish seta below the level of the spiracular fossa. Sternum VIII (Text-fig. 32) rather variable, with 5–8 long setae. Clasper (Text-fig. 31), measured from tip of manubrium to apex of fixed process, a little over twice as long as the movable process. Fovea of movable process situated at about one-fourth the length of the anterior margin from the apex. Manubrium not very long. Distal arm of sternum IX (Text-fig. 31) with a straight apical margin which forms about a right angle with the dorsal margin.

Female (Text-figs. 33, 48). Posterior margin of sternum VII (Text-fig. 33) with a fairly large ventral sinus; the sternum with 5–10 setae each side. Tergum VIII (Text-fig. 48) without setae anterior to the expansion of the spiracular fossa, but with a row of 3–6 setae below the spiracle. Anal stylet about four times as long as broad. Spermatheca as in Text-fig. 33.

LENGTH. ♂ 2–2½ mm.; ♀ 2–3 mm.

REMARK. This species is obviously a parasite of ground squirrels.

Rhadinopsylla (Actenophthalmus) arborea sp. n.

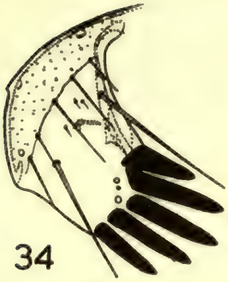
(Text-figs. 34–38, 50)

TYPE MATERIAL. Male holotype, female allotype and 10 ♂, 18 ♀ paratypes from Red Deer River, Canadian Rocky Mountains, from *Tamiasciurus hudsonicus baileyi*, 1907, A. D. Gregson.

DIAGNOSIS. Differing from related species by the greater relative height of the genal ctenidium; the male differs from *R. fraterna* by the absence of a seta on tergum VIII, from *R. orama* and *R. media* by having a lateral seta on the inner side of the hind tibia and from *R. difficilis* and *R. linta* by the structure of the modified segments. The female may be distinguished from that of related species by the high genal ctenidium and the long tubular portion of the spiracular fossa of tergum VIII.

DESCRIPTION. Genal ctenidium of five spines which do not touch each other at their bases; the height of the ctenidium is greater than in related species; the apex of the uppermost genal spine reaches to about two-thirds the length of the following spine (Text-figs. 34, 35). The five-segmented labial palp reaches to about four-fifths the length of the fore coxa. Pronotal ctenidium consisting of 22 spines (varying from 21 to 23). Metathorax of the *fraterna* type (see Text-fig. 60). Hind tibia with one lateral seta on the inner side. The longest apical seta of the second hind tarsal segment usually reaches to about the middle of the fourth segment. Fifth segment of all tarsi with four pairs of lateral plantar setae. Only one seta below the spiracular fossa on terga III–VI. Number of marginal spinelets on terga I–VI, ♂: 2 or 3 (1), 1 or 2 (3), 1 or 2 (3), 1 (2), 1 (0), 0 (1); ♀: 3 (2), 2 or 3 (1–4), 1 or 2 (3), 1 (2), 1 (0), 0 (1) respectively. Margin of tergum VII of the female below the two antesensilial setae distinctly concave (Text-fig. 38); the upper of these two setae is as long as or slightly longer than the lower.

Male (Text-figs. 36, 37). Tergum VIII without setae. Sternum VIII (Text-fig. 37) forming a broadly rounded lobe, with 4–7 long setae. Clasper (Text-fig. 36), measured from tip of manubrium to apex of fixed process, a little over twice as long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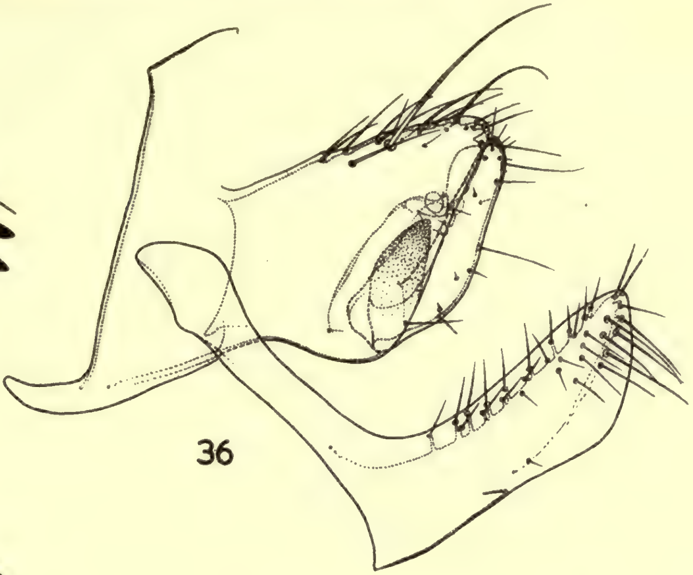
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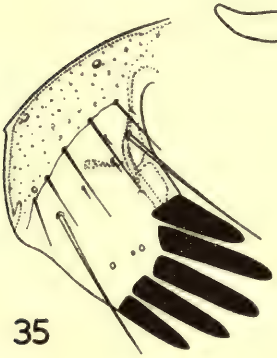
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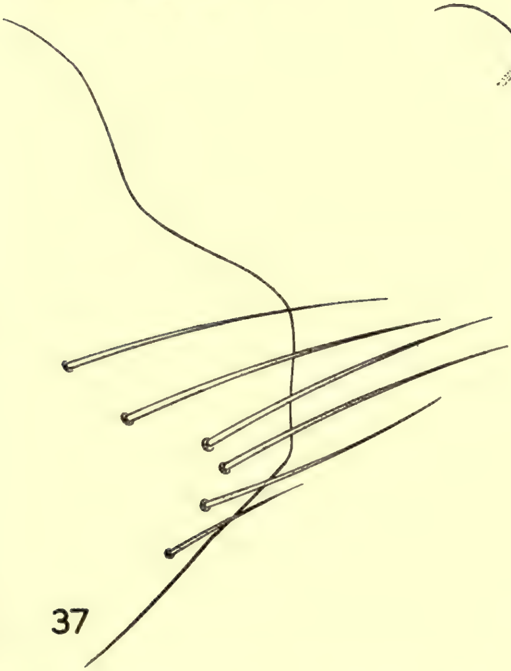
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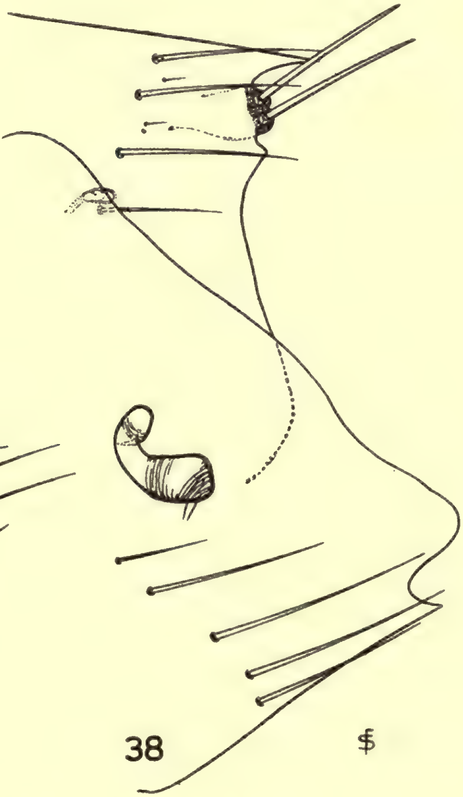
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FIGS. 34–38. *Rhadinopsylla* (*Actenophthalmus*) *arborea* sp. n. (Red Deer River, Alberta, Canada). 34. Preantennal part of head (holotype). 35. Preantennal part of head (allotype). 36. Clasper and sternum IX (holotype). 37. Sternum VIII (holotype). 38. Abdominal segment VII and spermatheca (paratype).

as the movable process. Fovea of the movable process at about the middle of the anterior margin of the process. Manubrium short. The very short acetabular seta is situated near the ventral end of the movable process. Distal arm of sternum IX (Text-fig. 36) with a very oblique apical margin.

Female (Text-figs. 38, 50). Posterior margin of sternum VII with a ventral sinus, above which a well-developed rounded lobe; with 4 or 5 setae each side (Text-fig. 38). A vertical row of 3 or 4 setae below the spiracular fossa of tergum VIII; the apical expansion of the fossa is rather small, but the tubular portion is long (Text-fig. 50). Anal stylet about thrice as long as its maximum width. Spermatheca as in Text-fig. 38.

LENGTH. ♂ 2–2½ mm., ♀ 2¼–3 mm.

REMARK. The occurrence of the representatives of this new species on a tree-squirrel is most unexpected since no other species of the genus occur on arboreal hosts; in view of the fact that it is so abundantly different from the ground-squirrel species *R. fraterna*, the tree-squirrel may indeed be the true host for *R. arborea*—it is worth noting that a long series was collected from (presumably the nest of) that host.

Rhadinopsylla (Actenophthalmus) media sp. n.

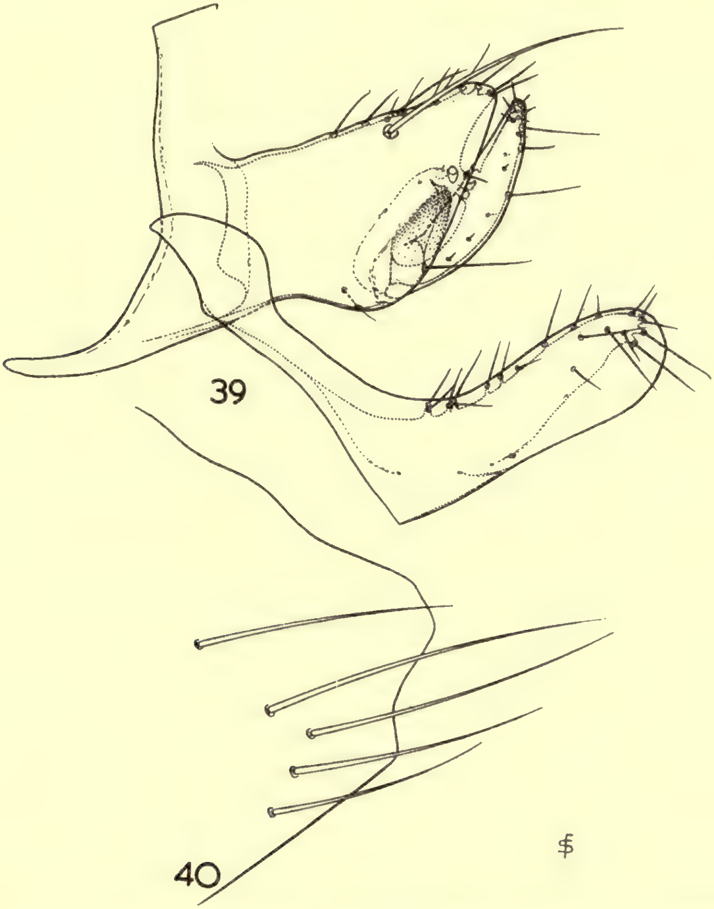
(Text-figs. 39, 40)

TYPE MATERIAL. Male holotype and two ♂ paratypes from Mingan, Quebec, Canada, from *Clethrionomys gapperi proteus*, 31.x.1947, R. Traub. Holotype in the U.S. National Museum, one paratype in the collection of Lt.-Col. R. Traub, one paratype in the Tring collection.

DIAGNOSIS. The male of this new species differs from that of related forms by the combination of the fovea of the movable process of the clasper being situated at about the middle of the anterior margin of the process and the rounded-off apex of the distal arm of sternum IX. Female not known.

DESCRIPTION. Genal ctenidium of the *fraterna* type, consisting of five spines, the apex of the uppermost spine reaching to about three-fifths the length of the fourth spine. The five-segmented labial palp reaches nearly to the apex of the fore coxa. Pronotal ctenidium with 21–22 spines. Metathorax of the *fraterna* type (see Text-fig. 60). No lateral setae on the inner side of the hind tibia. Longest apical seta of the second hind tarsal segment reaching only a little beyond the apex of the third segment. Fifth segment of all tarsi with four pairs of lateral plantar setae. One seta below the spiracular fossa on terga III–VI. Numbers of marginal spinelets on terga I–VI, ♂: 2 or 3, 2, 2, 2 (1), 1 or 2, 1 (0) respectively. Sensilium with apparently 12 trichobothria per side.

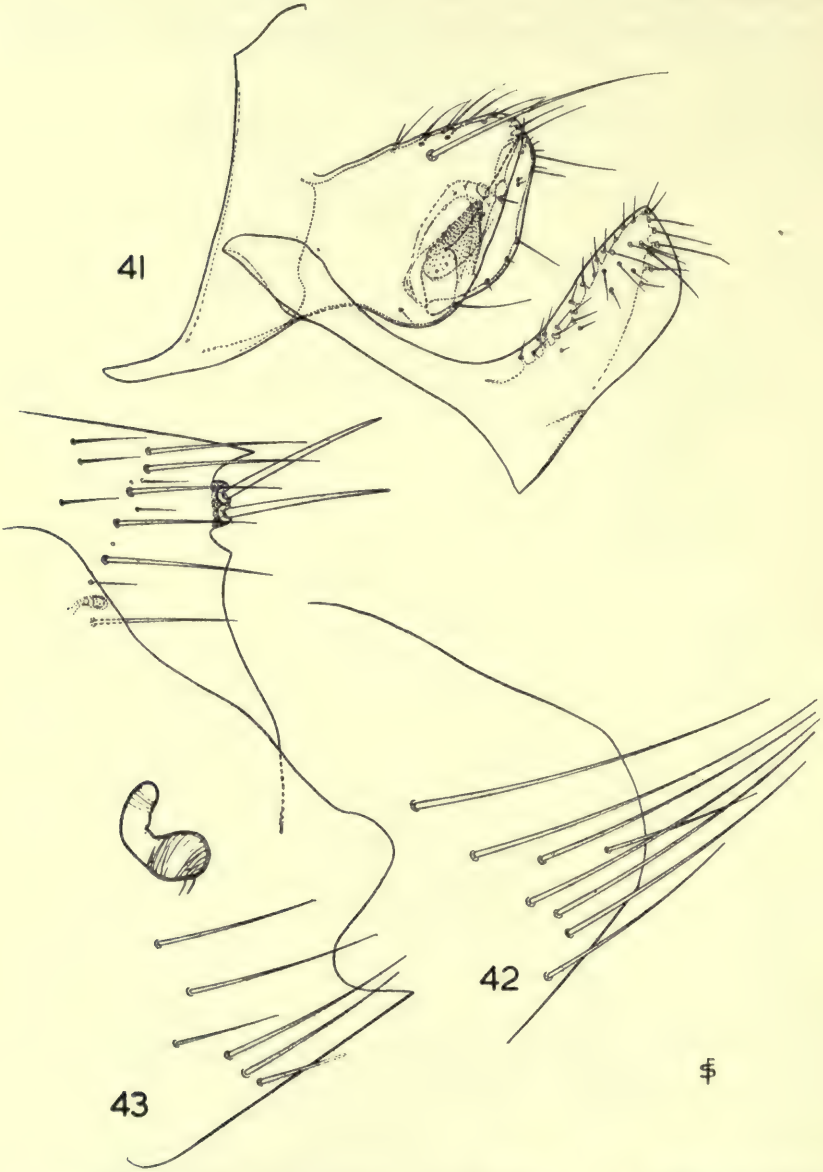
Male. Tergum VIII without setae. Posterior margin of sternum VIII (Text-fig. 40) forming a projecting lobe; the sternum normally with five long setae each side. Clasper (Text-fig. 39), measured from tip of manubrium to apex of fixed process, a little over twice as long as the movable process. Angle of anterior margin of movable process situated a little below the middle of the margin, the fovea being at about the middle of the anterior margin. Manubrium fairly slender, but in one specimen somewhat shorter than in the specimen drawn. The acetabular seta is placed well above the level of the ventral margin of the movable process. Distal arm of sternum IX (Text-fig. 39) only a little widening towards the apex, which bears rather few setae ; the apical margin of this arm is smoothly rounded.



FIGS. 39, 40. *Rhadinopsylla* (*Actenophthalmus*) *media* sp. n. (holotype). 39. Clasper and sternum IX. 40. Sternum VIII.

LENGTH. ♂ 2–2½ mm.

REMARK. In the Rothschild collection are a few specimens from Alberta and British Columbia (Kicking Horse Canyon) which agree fairly well with the Mingan males, but in view of geographical considerations I refrain as yet from identifying these west Canadian specimens as belonging to *R. media*.



FIGS. 41–43. *Rhadinopsylla* (*Actenophthalmus*) *difficilis* sp. n. 41. Clasper and sternum IX (holotype). 42. Sternum VIII (holotype). 43. Abdominal segment VII and spermatheca (allotype).

Rhadinopsylla (Actenophthalmus) difficilis sp. n.

(Figs. 41–43, 47)

Type material. Male holotype, female allotype and one female paratype from Kelowna, British Columbia, from *Mustela* sp., collected on 24.xii.1919 (holotype) and xii.1922–i.1923 (allotype and paratype) by A. Tate; 1 ♀ paratype, Cedar Creek, Upper Columbia Valley, from *Putorius cicognani*, 26.v.1910, W. Wenmann.

Diagnosis. The male can be distinguished from that of related forms by the structure of the modified abdominal segments; the female resembles that of *R. fraterna*, but it has only one seta below the spiracle of terga III–VI and the spiracular fossa of tergum VIII is somewhat larger.

Description. Genal ctenidium consisting of five spines, the uppermost of which is basally distinctly broader than the other four spines and its apex reaches to about two-thirds or five-eighths the length of the neighbouring spine. The five-segmented labial palp reaches to about three-fourths the length of the fore coxa. Pronotal ctenidium with 21 spines in the single available male, 21 to 23 in the female. Metathorax of the *fraterna* type (see Text-fig. 60). Hind tibia with or without a seta on the inner side. Longest apical seta of the second hind tarsal segment reaching to a little beyond the middle of the fourth segment. Fifth segment of all tarsi with four pairs of lateral plantar setae. One seta below the spiracular fossa in terga III–VI. Numbers of marginal spinelets on terga I–VI, ♂: 2 or 3, 2, 1 or 2, 1, 1, 0; ♀: 2 or 3, 2–4, 1 or 2, 1 or 2, 1, 0 (1) respectively. Tergum VII of female as in Text-fig. 43.

Male. Tergum VIII without setae. Posterior margin of sternum VIII (Text-fig. 42) very broadly rounded, the sternum with 5–8 long setae per side. Clasper (Text-fig. 41), measured from tip of manubrium to apex of fixed process, two and a half times as long as the movable process. Fovea situated at the middle of the anterior margin of the movable process, the latter rather broad and short. The acetabular seta is placed at the level of the lower end of the movable process. Distal arm of sternum IX (Text-fig. 41) about thrice as long as wide, with a fairly oblique apex.

Female. Posterior margin of sternum VII with a large ventral sinus; the sternum has a row of 4–6 setae each side (Text-fig. 43). A row of 3–4 setae below the spiracular fossa of tergum VIII, the fossa rather large (Text-fig. 47). Anal stylet about four times as long as broad. Spermatheca as in Text-fig. 43.

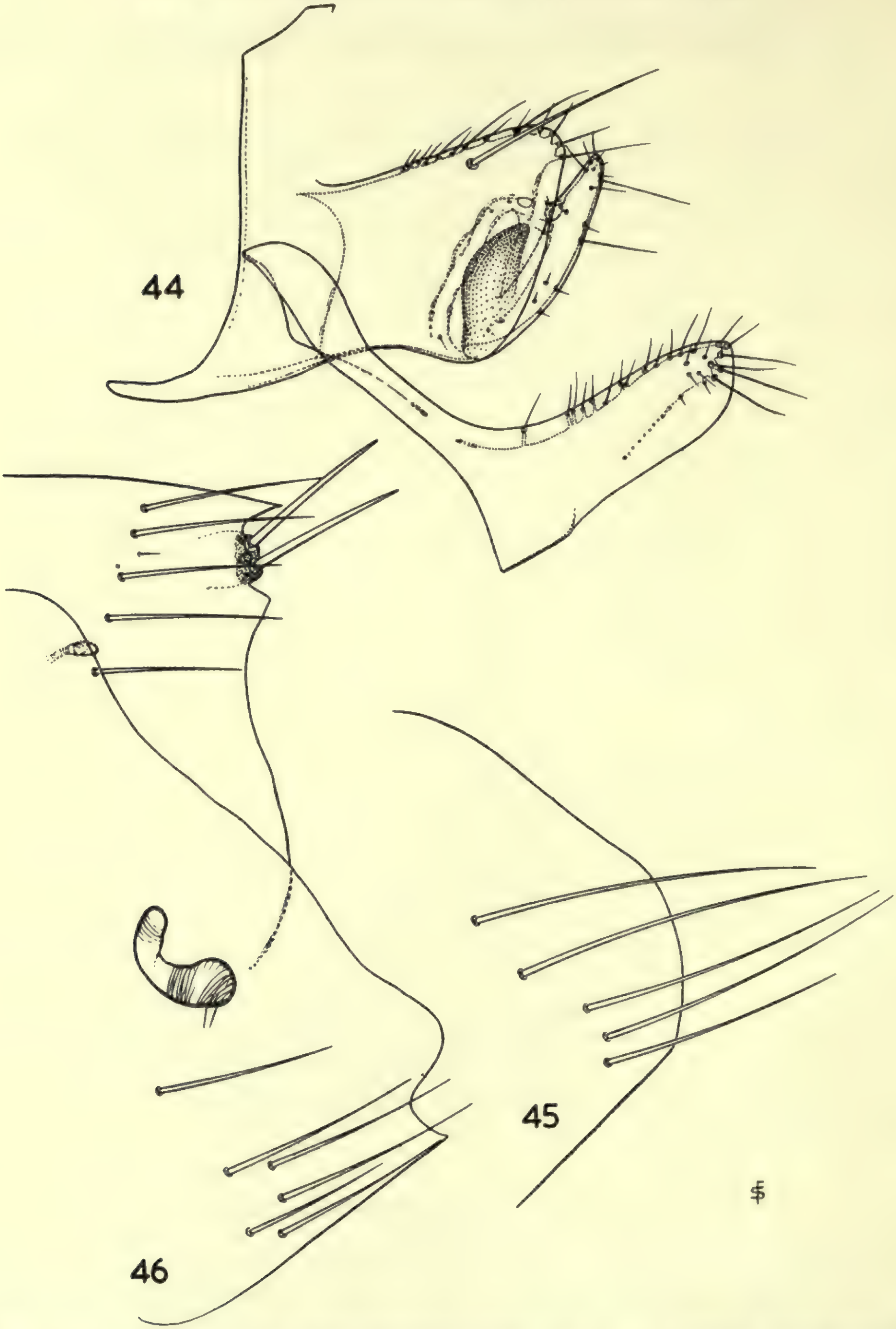
Length. ♂ 1¾ mm., ♀ 2½ mm.

Rhadinopsylla (Actenophthalmus) linta sp. n.

(Text-figs. 44–46, 49)

Type material. Male holotype, female allotype and one female paratype from Atlin, British Columbia, from *Clethrionomys rutilus dawsoni* (holotype) and *Neotoma cinerea saxamans*, 1933, H. S. Swarth.

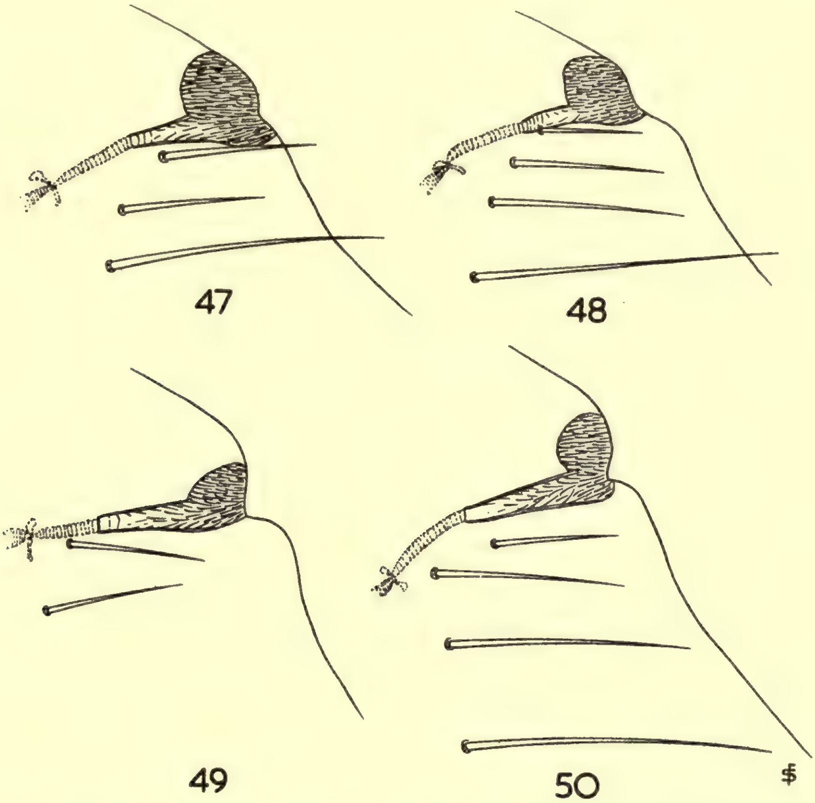
Diagnosis. The male differs from that of related species with no setae on tergum



FIGS. 44–46. *Rhadinopsylla* (*Actenophthalmus*) *linta* sp. n. 44. Clasper and sternum IX (holotype). 45. Sternum VIII (holotype). 46. Abdominal segment VII and spermatheca (allotype).

VIII by the shape of sternum VIII, movable process and sternum IX; the female may not be easily distinguishable from that of related species.

DESCRIPTION. The upper of the five genal spines (in one female six on both sides) is basally broader than the other four spines and its apex reaches to about two-thirds the length of the neighbouring spine. The five-segmented labial palp reaches to about three-fourths the length of the fore coxa in the male, and to near the apex of the fore coxa in the female. Pronotal ctenidium consisting of 22–23 spines. Metathorax of the *fraterna* type (see Text-fig. 60). One or two setae on the inner side of the hind tibia. Longest apical seta of the second hind tarsal segment reaching to the middle of the fourth segment. Fifth segment of all tarsi with four pairs of lateral plantar setae. One seta below the spiracular fossa on terga III–VI. Numbers of marginal spinelets on terga I–VI, ♂: 2 or 3, 2, 1, 1 or 2, 1, 1; ♀: 3 or 4, 2 (3), 2, 1 (2), 1 (0), 0 (1) respectively. Tergum VII of the female as in Text-fig. 46. Sensilium with 12 trichobothria each side.



FIGS. 47–50. Dorsal part of tergum VIII, ♀, of: 47. *Rhadinopsylla* (*Actenophthalmus*) *difficilis* sp. n. (paratype). 48. *R.* (*A.*) *fraterna* (Baker) (Montana). *R.* (*A.*) *linta* sp. n. (allotype). 50. *R.* (*A.*) *arborea* sp. n. (allotype).

Male. Tergum VIII without setae. Sternum VIII (Text-fig. 45) with six setae each side and a rounded posterior margin. Clasper (Text-fig. 44), measured from tip of manubrium to apex of fixed process, twice as long as the movable process. Angle of anterior margin of movable process placed a little above the middle of this margin. Manubrium fairly long. No trace of an acetabular seta could be found in the male, but this is no doubt an abnormality. Distal arm of sternum IX (Text-fig. 44) distinctly and gradually narrowing towards the oblique apex.

Female. Posterior margin of sternum VII with a fairly large ventral sinus ; the sternum with 7–11 setae each side (Text-fig. 46). In one female (Text-fig. 49) there are 2 or 3 setae below the spiracle of tergum VIII, in the other 7 (this may be abnormal). Apical expansion of the spiracular fossa of tergum VIII very small (Text-fig. 49). Anal stylet four times as long as broad. Spermatheca as in Text-fig. 46.

LENGTH. ♂ 2½ mm., ♀ 2½–3 mm.

The Taxonomic Value of the Metathorax in RHADINOPSYLLA

In general little use has been made of the structure of the metathorax of fleas for taxonomic purposes. Admittedly, in a number of genera the metathorax appears to be rather uniform in structure in all the members of a particular genus, but the members of *Rhadinopsylla* demonstrate a great variety in this segment, serving as an important aid in the identification of these fleas which on the whole are not easy to identify. The metathorax is practically not sexually dimorphic.

The main points of taxonomic interest in the metathorax of species examined[1] are :

I. The development of the internal sclerotized vertical ridge of the metanotum situated under the main row of setae ; the following degrees of development can be distinguished :

(*a*) The ridge is complete and its ventral end joins the upper part of the posterior vertical ridge of the metepisternum ;
(*b*) the ridge extends downward to about the lowest seta of the main row ;
(*c*) the ridge extends at most to about the middle of the main row of setae ;
(*d*) the ridge is absent.

II. Number of setae on the metasternum ; there is always one large seta (*a*), but in a number of species there is an additional shorter seta above it (*b*).

III. Suture between the ventral margin of the metanotal collar and the dorso-anterior margin of the metepimeron ; the following degrees of development can be enumerated :

(*a*) The suture extends downwards to below the dorso-posterior angle of the metepisternum ;

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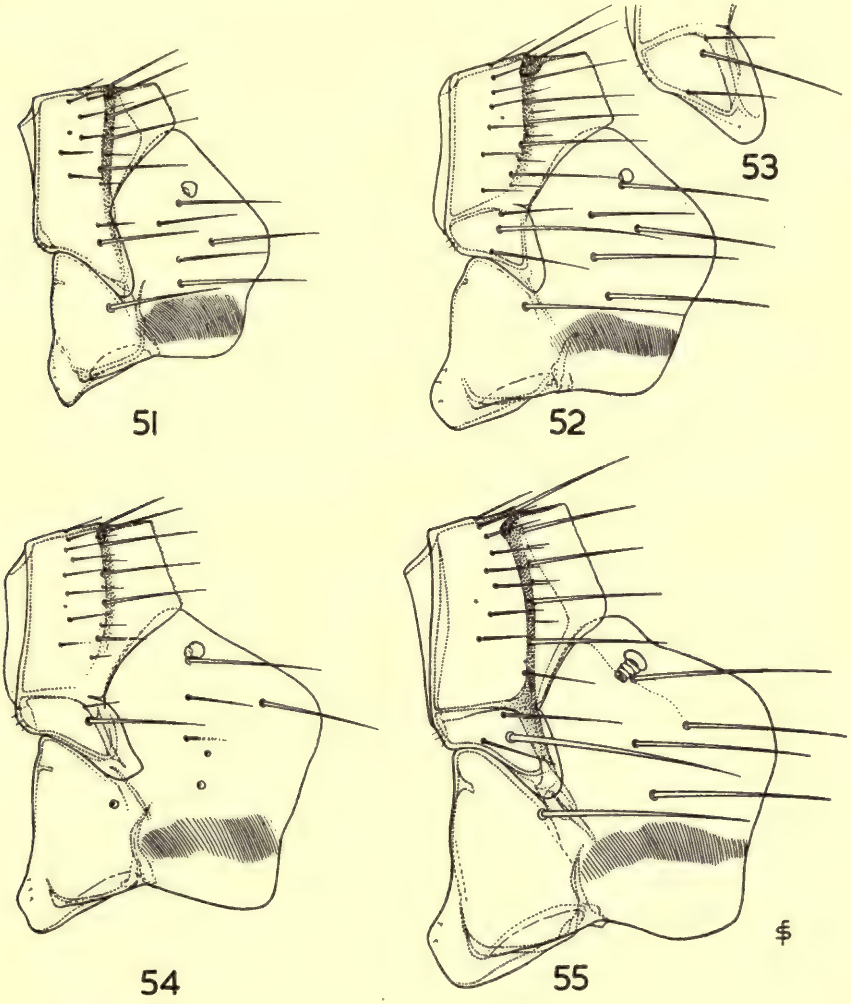
[1] No specimens of the following species and subspecies of *Rhadinopsylla* have been available for study : subgenus *Ralipsylla : li li* Argyropulo, *li transbaikalica* Ioff & Tiflov, *semenovi* Argyropulo, *ventricosa murium* Ioff & Tiflov ; subgenus *Actenophthalmus : accola* Wagner, *acuminata* Ioff & Tiflov, *altaica* (Wagner), *aspalacis* Ioff & Tiflov, *dahurica diclinica* Tiflov, *d. tjanshan* Ioff & Tiflov, *d. vicina* Wagner, *caucasica* Argyropulo, *mexicana* Barrera, *pilosa* Ioff & Tiflov, *pseudodahurica* Scalon and *rothschildi* Ioff.

(*b*) the suture reaches to or almost to that angle ;

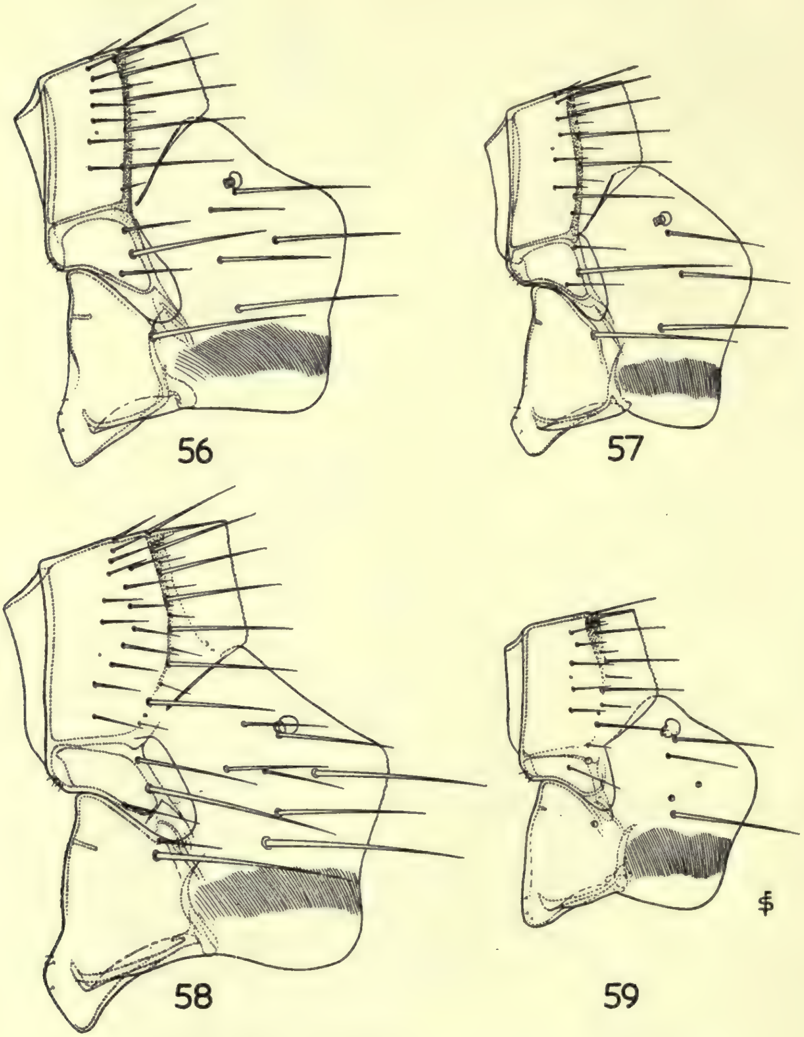
(*c*) the suture reaches to about the middle or two-thirds of the distance to the dorso-posterior metepisternal angle ;



Figs. 51, 52. Metathorax of ♂ of : 51. *Rhadinopsylla* (*Micropsylla*) *sectilis goodi* (Hubbard) (Vancouver, British Columbia). 52. *Rhadinopsylla* (*Rhadinopsylla*) *cedestis* Rothschild (near Panfilov, S.E. Kazakhstan). Fig. 53. *Rhadinopsylla* (*Rhadinopsylla*) ***masculana*** J. & R. (allotype, ♀, Khenchela, Algeria). Figs. 54, 55. Metathorax of : 54. *Rhadinopsylla* (*Micropsylloides*) *jaonis* Jordan (♀, Ilan, NW. Sunkiang prov., Manchuria). 55. *Rhadinopsylla* (*Ralipsylla*) *ventricosa* Ioff & Tiflov (♂, Ottuk, Tyan-Shan).

(*d*) the suture reaches at most to half that distance but continues as a faint thin line;

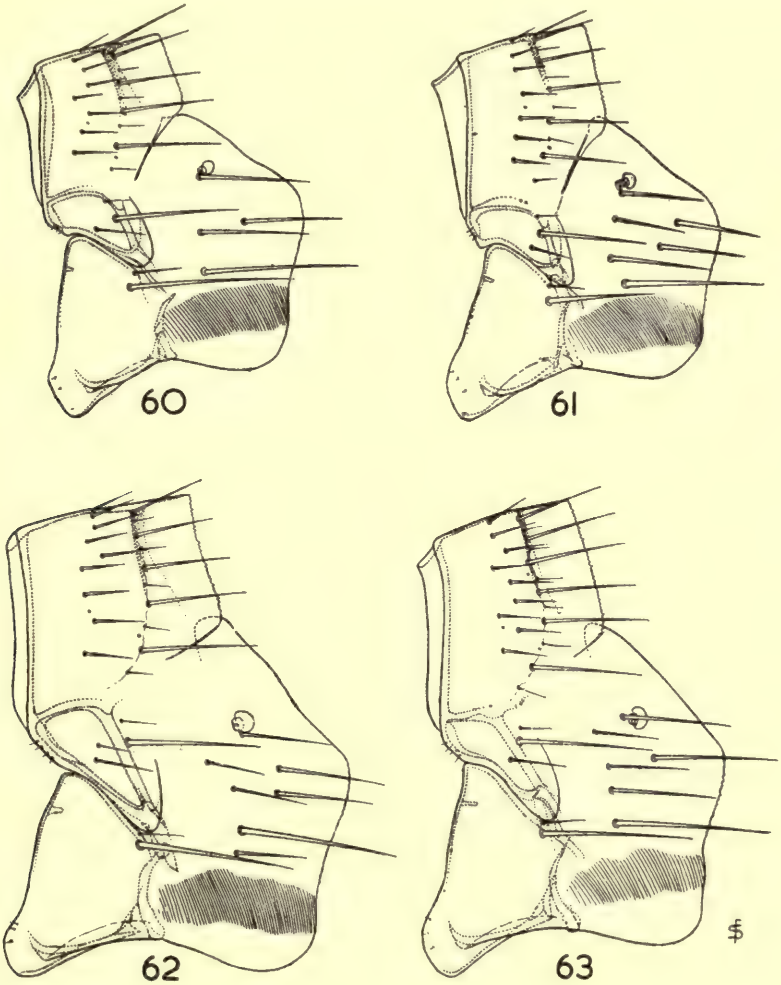
(*e*) the suture reaches at most to half the distance but does not usually continue as a faint thin line.



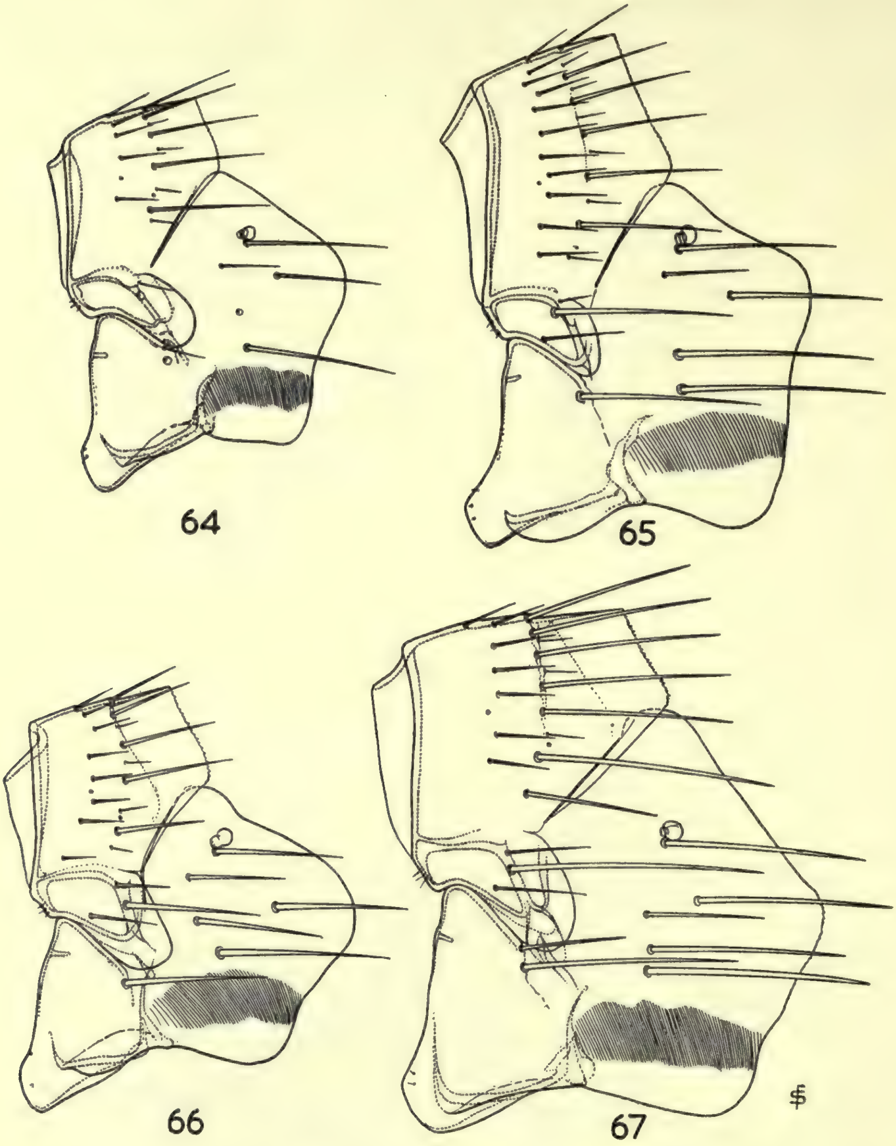
FIGS. 56–59. Metathorax of ♂ of: 56. *Rhadinopsylla* (*Actenophthalmus*) *pentacantha* (Rothschild) (Tring). 57. *R.* (*A.*) *japonica* Sakaguti & Jameson (paratype, Mt. Kurama, Japan). 58. *R.* (*A.*) *dives* Jordan (paratype, Tsienkiatien, 25 miles E. of Tungliao, Manchuria). 59. *R.* (*A.*) *dahurica dahurica* J. & R. (paratype, Manchouli (= Lupin), Manchuria).

IV. The dorsal horizontal ridge of the metepisternum. This is absent only in the subgenus *Micropsylla* (Text-fig. 51) ; in the species of the other subgenera it is developed in a variety of ways, see Text-figs. 52–75.

V. The junction between the dorsal and the posterior ridge of the metepisternum ; only in three species of *Rhadinopsylla* s. str. (*cedestis*, *socia* and *ukrainica*) these two ridges do not join up.



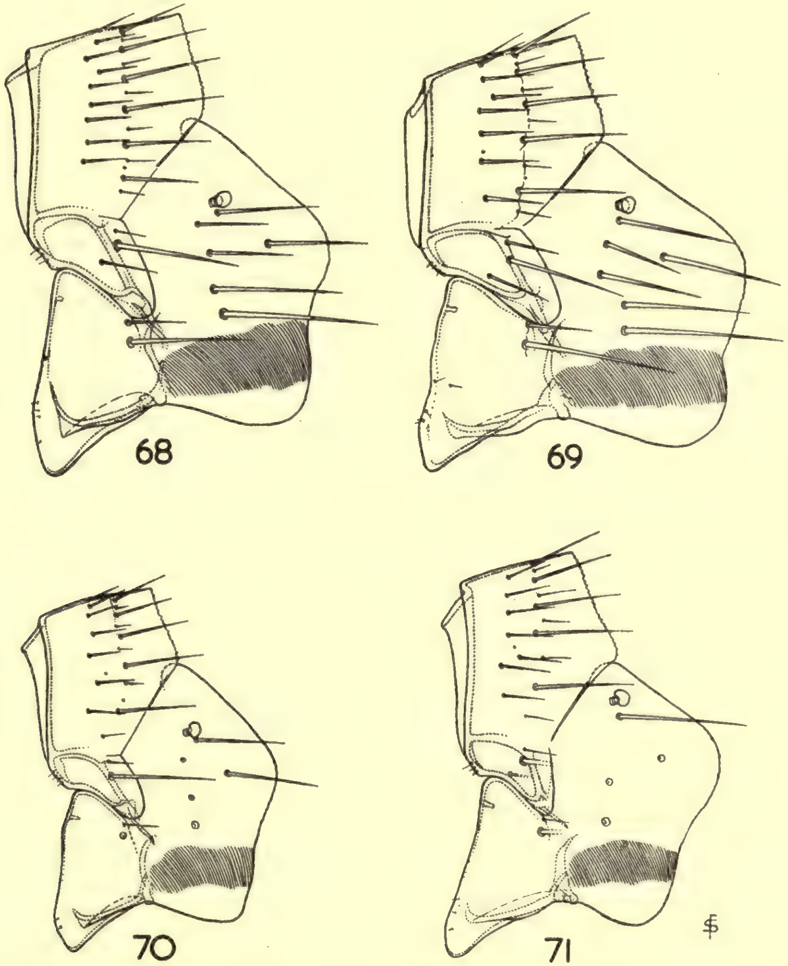
FIGS. 60–63. Metathorax of : 60. *Rhadinopsylla* (*Actenophthalmus*) *fraterna* (Baker) (♂, Ravalli Co., Montana). 61. *R.* (*A.*) *integella* J. & R. (♂, Schwarzwald Alp, B.O., Switzerland). 62. *R.* (*A.*) *valenti* Darskaya (♀, Taegu, Korea). 63. *R.* (*A.*) *insolita* Jordan (♂, Ta-Lin, near Tsienkiatien, Manchuria).



Figs. 64–67. Metathorax of ♂ of : 64. *Rhadinopsylla* (*Actenophthalmus*) *multidenticulata* Morlan & Prince (Greenlee Co., Arizona). 65. *R.* (*A.*) *ioffi* Wagner (Katon-Karagai, Altai, E. Kazakhstan). 66. *R.* (*A.*) *mesa* J. & R. (near Wengen, B.O., Switzerland). 67. *R.* (*A.*) *heiseri* (McCoy) (Washington Co., Utah).

VI. Number of setae on the metepisternum; the normal number is three, but there are only two setae in the subgenera *Micropsylla* and *Micropsylloides* and in *R.* (*A.*) *tenella*, while in the one specimen of *R.* (*A.*) *strouhali* studied there is only one seta on either side, but that may be abnormal.

VII. Shape of metepisternum; this varies a great deal and I refer to Text-figs. 51–75 since the different shapes would be difficult to describe.

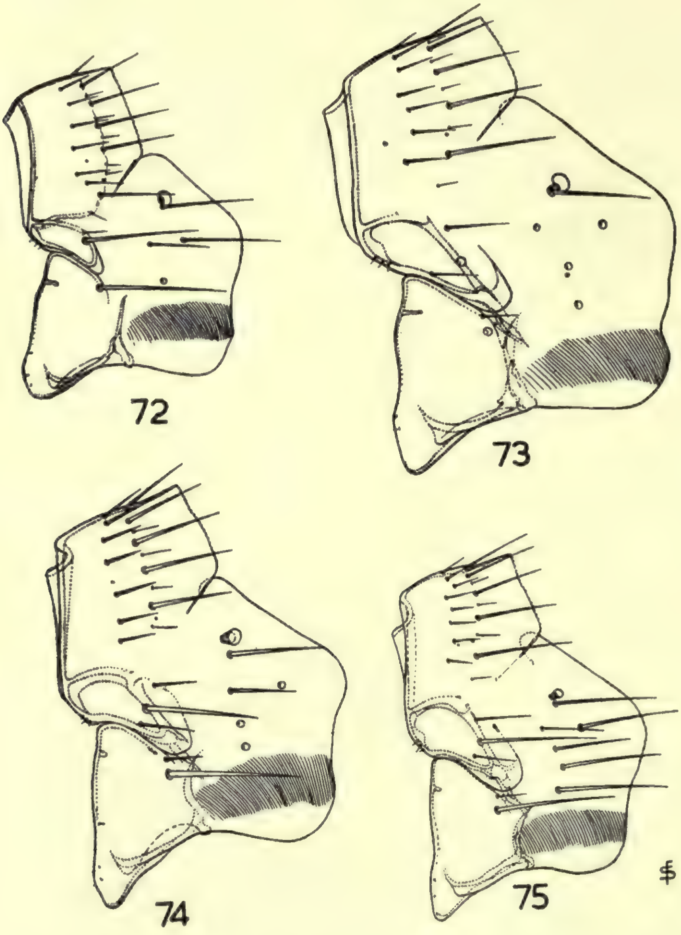


Figs. 68–71. Metathorax of ♂ of: 68. *Rhadinopsylla* (*Actenophthalmus*) *isacantha continentalis* ssp. n. (Buré d'Orval, Meurthe-et-Moselle, France). 69. *R.* (*A.*) *dolomydis* Smit (paratype, Mt. Trebević, Bosnia, Yugoslavia). 70. *R.* (*A.*) *concava* Ioff & Tiflov (Korea). 71. *R.* (*A.*) *angusta* Tiflov (Trans-Ili Alatau, south of Alma Ata, Kazakhstan).

VIII. The shape of the metasternum and of the metepimeron differs considerably in the various species ; see Text-figs. 51–75.

IX. The chaetotaxy of the metepimeron varies somewhat ; see Text-figs. 51–75.

X. The shape and length of the furca are individually too variable to be of much use for taxonomic purposes.



Figs. 72–75. Metathorax of : 72. *Rhadinopsylla* (*Actenophthalmus*) *tenella* Jordan (holotype ♂, near Tsienkiatien, Manchuria). 73. *R.* (*A.*) *attenuata* Jameson & Sakaguti (♀, Ohara, Honshu, Japan). 74. *R.* (*A.*) *bureschi* Jordan (holotype ♂, Ćam-Kuria, Bulgaria). 75. *R.* (*A.*) *orama* sp. n. (holotype ♂, Lee Co., Virginia, U.S.A.).

Table of Characters I–III of the Metathorax in Rhadinopsylla.

	I(*a*)	I(*b*)	I(*c*)	I(*d*)	II(*a*)	II(*b*)	III(*a*)	III(*b*)	III(*c*)	III(*d*)	III(*e*)
Subgenus *Micropsylla*											
sectilis sspp. (Text-fig. 51)	+	−	−	−	+	−	−	+	−	−	−
Subgenus *Rhadinopsylla*											
masculana Text-fig. 53)	−	−	+	+	−	+	+	−	−	−	−
bivirgis	−	+	−	−	−	+	+	−	−	−	−
cedestis (Text-fig. 52)	−	+	−	−	+	−	+	−	−	−	−
socia	−	+	−	−	+	−	+	−	−	−	−
ukrainica	−	+	−	−	+	−	+	−	−	−	−
Subgenus *Micropsylloides*											
jaonis (Text-fig. 54)	−	+	−	−	+	−	+	−	−	−	−
Subgenus *Ralipsylla*											
v. ventricosa (Text-fig. 55)	+	−	−	−	+	−	−	+	−	−	−
Subgenus *Actenophthalmus*											
pentacantha (Text-fig. 56)	+	−	−	−	+	−	−	+	−	−	−
japonica (Text-fig. 57)	+	−	−	−	+	−	−	+	−	−	−
dives (Text-fig. 58)	−	+	+	−	−	+	−	−	+	−	−
d. dahurica (Text-fig. 59)	−	−	+	−	−	+	−	+	−	−	−
fraterna (Text-fig. 60)	−	−	+	−	−	+	−	−	+	−	−
arborea	−	−	+	−	−	+	−	−	+	−	−
media	−	−	+	−	+	−	−	−	+	−	−
difficilis	−	−	+	−	−	+	−	−	+	−	−
linta	−	−	+	−	−	+	−	−	+	−	−
integella (Text-fig. 61)	−	−	+	−	−	+	−	−	+	−	−
valenti (Text-fig. 62)	−	−	+	−	?	?	−	−	−	−	+
insolita (Text-fig. 63)	−	−	+	−	−	+	−	−	−	−	+
multidenticulata (Text-fig. 64)	−	−	−	+	−	+	−	+	−	−	−
ioffi (Text-fig. 65)	−	−	−	+	?	?	−	+	−	−	−
mesa (Text-fig. 66)	−	−	−	+	+	−	+	−	−	−	−
mesoides	−	−	−	+	+	−	+	−	−	−	−
heiseri (Text-fig. 67)	−	−	−	+	−	+	−	+	−	−	−
isacantha sspp. (Text-fig. 68)	−	−	−	+	−	+	−	−	−	+	−
strouhali	−	−	−	+	−	+	−	−	−	+	−
dolomydis (Text-fig. 69)	−	−	−	+	−	+	−	−	−	+	−
concava (Text-fig. 70)	−	−	−	+	−	+	−	−	−	+	−
angusta (Text-fig. 71)	−	−	−	+	−	+	−	+	−	−	−
tenella (Text-fig. 72)	−	−	−	+	?	?	−	−	−	−	+
attenuata (Text-fig. 73)	−	−	−	+	−	+	−	−	−	−	+
bureschi (Text-fig. 74)	−	−	−	+	−	+	−	−	−	−	+
orama (Text-fig. 75)	−	−	−	+	−	+	−	−	−	+	−

ACKNOWLEDGMENTS

I am deeply indebted to the following colleagues for the loan or donation of specimens: Dr. G. M. Dunnet (loan of the holotype of *Idilla caelebs*), Mr. R. B. Freeman (donation of two pairs of *R. i. isacantha*), Professor H. Strouhal (loan of the holotype of *R. strouhali*), Dr. P. T. Johnson (loan of paratypes of *R. orama*), Capt. V. J. Tipton (loan of *R. valenti* and gift of *R. concava*) and Lt.-Col. R. Traub (loan and gift of type material of *R. orama* and *R. media*).

BRITISH MUSEUM
20 DEC 1957
NATURAL HISTORY

NEUE EROTYLIDEN AUS DEM BRITISCHEN MUSEUM

21. BEITRAG ZUR KENNTNIS DER EROTYLIDEN (COL.)

KURT DELKESKAMP

BULLETIN OF
THE BRITISH MUSEUM (NATURAL HISTORY)
ENTOMOLOGY Vol. 6 No. 3
LONDON : 1957

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VON

KURT DELKESKAMP ref.

Berlin

Pp. 77–90 ; 5 *Text figures*

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BRITISH MUSEUM
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NATURAL HISTORY

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NEUE EROTYLIDEN AUS DEM BRITISCHEN MUSEUM

21. BEITRAG ZUR KENNTNIS DER EROTYLIDEN (COL.)

Von KURT DELKESKAMP

SYNOPSIS

This paper is based mainly on material in the British Museum (N.H.). Two new species and one new subspecies of *Amblyopus* are described.

The name *Scelidopetalon* is proposed for *Petaloscelis* Gorh. 1896 (nec. Bergroth 1893) and a new species of *Scelidopetalon* is described.

One new species and one new subspecies of *Aulacochilus* are described and also a new species of *Tamboria*.

The holotypes of the new species, with the exception of *Amblyopus niger*, *A. cinctipennis* Lac. ssp. *trimaculatus* and *Tamboria coerulea* are in the British Museum (N.H.).

Vom Britischen Museum, London, erhielt ich eine kleine Kollektion von Erotyliden, deren Bearbeitung sich Herr G. J. Arrow vorgenommen hatte, aber leider nicht mehr durchführen konnte, weil ihm der Tod am 4.x.1948 die Feder aus der Hand nahm. Da ich mit Herrn G. J. Arrow stets in bestem Einvernehmen stand und mich seiner besonderen Unterstützung nach Beendigung des 2. Weltkrieges erfreuen durfte, komme ich der Bitte von Fräulein C. M. F. von Hayek um Bearbeitung des Nachlasses gern nach und teile im folgenden das Ergebnis meiner Untersuchungen mit. Die aethiopischen Vertreter der Gattungen *Amblyopus* Lac. und *Amblyscelis* Gorh. werden im folgenden nicht behandelt, da sie in einer gesonderten Publikation Berücksichtigung finden, die Herr H. Philipp, mein Diplomand in der Coleopteren Abteilung hiesigen Museums, in Kürze herausbringen wird und die eine Revision beider Genera zum Thema hat. Zusätzlich werden ausser einigen systematischen Richtigstellungen 2 neue Arten und 1 neue Rasse aus dem Zoologischen Museum zu Berlin beschrieben, die sich in den Rahmen der von Arrow hinterlassenen Arten zwanglos einfügen bzw. von ihm geäusserte Ansichten bekräftigen.

Amblyopus palliditarsis sp. n.

Länge 4,5–6,2 mm., Breite 2,5–3,7 mm.

Körper gewölbt, Färbung pechbraun bis schwarz, nur Fühler, Mundteile und Tarsen gleichwie bei *A. pallidicornis* Arrow rötlichgelb. Kopf und Halsschild dicht punktiert, schwach chagriniert und daher matt glänzend. Flügeldecken mit stärker eingeritzten Punktstreifen und sehr fein punktulierten Interstitien, nicht chagriniert, daher lackglänzend. Augen gross und grob fazettiert, ihr Abstand voneinander gleich 1,6 mal der von vorn sichtbaren Augenbreite. Halsschild: Seiten gerundet, fein gerandet und nach vorn konvergierend; Vorderrand doppelbuchtig, in der Mitte leicht konvex, zu beiden Seiten leicht konkav; Vorderecken verrundet, Hinterecken stumpfwinklig mit grossem Porenpunkt. Scutellum zart punktiert, Länge: Breite wie 1 : 1,7. Prosternum median im vorderen Teil schwach gekielt, der Vorderrand in der Mitte winklig vorspringend. Die Tangentiallinien des Prosternum erstrecken sich über ⅔ seiner Länge, verlaufen im vorderen Teil fast parallel und sind an der Spitze hakenförmig einwärts gebogen. Tangentiallinien der Mittel- und Hinterhüften vorhanden. Fühler zart, das 3. Glied so lang wie das 4. + 5. zusammen, 4. — 6. Glied gestreckt, 7. + 8. Glied perlförmig, Fühlerkeule schmal, letztes Glied klein und zugespitzt. Tibien normal, gegen die Spitze nicht auffallend verbreitert. Endglied des Maxillar-Palpus doppelt so breit wie lang. Die Lacinia ist unbewehrt.

Von *palliditarsis* ist der ihm sehr ähnliche *A. pallidicornis* Arrow durch folgende Merkmale leicht zu unterscheiden: die Glieder der Fühlerkeule sind sehr kurz und breit (strongly transverse). Die Augen stehen nicht so eng, ihr Abstand beträgt das Doppelte der Augenbreite. Die Seiten des Halsschildes sind nur ganz schwach gerundet, fast gerade verlaufend; die Vorderecken treten nicht hervor und liegen mit dem Vorderrand in gleicher Ebene. Kopf und Halsschild sind viel zarter punktiert, nicht chagriniert und daher gleichwie die Elytren lackglänzend. Das Schildchen ist schmaler und nicht punktiert. Die Punktulierung der Interstitien auf den Elytren ist so zart, dass sie fast glatt erscheinen. Die Tangentiallinien der Vorderbrust verlaufen nicht parallel, sondern konvergieren nach vorn, so dass die Tangentialfigur glockenförmig erscheint.

Holotypus im Britischen Museum, London. Fundort: Tonkin, A de Cooman, 1929.

28 Paratypen vom gleichen Fundort.

Amblyopus niger sp. n.

Länge 4,2–5 mm., Breite 2,3–2,7 mm.

Obwohl die Art nicht zum Nachlass von Arrow gehört, erfolgt ihre Neubeschreibung gleichwohl in dieser Arbeit, da das Zoologische Museum zu Berlin dem Britischen Museum, London, 2 Exemplare dediziert, um die 3 oberseits gleichförmig schwarzen und auf den ersten Blick einander sehr ähnlichen Arten der Gattung *Amblyopus* (*pallidicornis* Arrow, *palliditarsis* sp. n. und *niger* sp. n.) wenigstens an einer Stelle an Hand der Tiere selbst miteinander vergleichen und die massgeblichen Unterschiede erkennen zu können.

Körper gleich der vorhergehenden Art gewölbt. Färbung: Oberseite schwarz, Unterseite braunschwarz und ± ausgedehnt rötlich-braun. Mundteile, Fühler und Beine von wechselnder Farbe: gelb über gelblich-rot bis braunschwarz. Die Tarsen kontrastieren also nicht wie bei *palliditarsis* durch helle (rötlich-gelbe) Färbung von den übrigen Beinabschnitten, sondern haben ± die gleiche Färbung wie diese. Kopf und Halsschild schwächer als bei *palliditarsis* punktiert, nicht chagriniert, sondern gleich den Elytren glänzend. Diese mit stärker eingeritzten Punktstreifen und deutlich punktulierten Interstitien. Abstand der grobfazettierten Augen grösser als bei *palliditarsis*, gleich 2 mal der von vorn sichtbaren Augenbreite. Form des Halsschildes gleich der von *pallidicornis* Arrow, also mit fast geradem Vorderrand ohne hervortretende Vorderecken. Scutellum deutlich punktuliert, schmaler als bei *palliditarsis*, ca ebenso lang wie breit. Prosternum median im vorderen Teil nicht gekielt, der Vorderrand in der Mitte nicht winklig vorspringend. Die Tangentiallinien des Prosternum erstrecken sich über $\frac{2}{3}$ seiner Länge und verlaufen im vorderen Teil fast parallel, die des Metasternum fehlen oder sind nur ganz schwach angedeutet und die des 1. Abdominalsegmentes sind vorhanden und deutlich sichtbar. Fühler zart, das 3. Glied so lang wie das 4. + 5. zusammen, 4. — 6. Glied gestreckt, 7. + 8. kugelig, die Glieder der Fühlerkeule kurz und breit (strongly transverse), entsprechen also denen von *pallidicornis*. Tibien gegen die Spitze eckig erweitert, die der Mittel- und Hintertibien sogar unter Bildung eines vortretenden Zahnes. Endglied des Maxillar-Palpus mehr als doppelt so breit wie lang (2,5 : 1).

Von dem ihm sehr ähnlichen *pallidicornis* Arrow unterscheidet sich *niger* in erster Linie durch die gegen die Spitze eckig erweiterten Tibien, sodann durch die deutlich sichtbare Punktulierung der Interstitien auf den Elytren, durch grössere Körpermasse (4,2–5 mm. gegen 3,8 mm.) und durch die Tangentiallinien : die des Prosternum verlaufen im vorderen Teil fast parallel, die des Metasternum fehlen oder sind nur schwach angedeutet.

Holotypus im Zoologischen Museum, Berlin. Fundort : India or.: Nagpore.

8 Paratypen vom gleichen Fundort.

Zur leichteren Unterscheidung der 3 oberseits gleichförmig schwarzen Arten lasse ich eine Bestimmungstabelle folgen.

BESTIMMUNGSTABELLE

1 Fühlerkeule schmal, ihr Endglied zugespitzt . . . *palliditarsis* sp. n.
— Fühlerkeule breit, ihre 3 Glieder kurz und breit (strongly transverse) . . . 2
2 Tibien gegen die Spitze auffallend eckig erweitert, die der Mittel- und Hinterbeine auf der Aussenkante mit Zahnbildung. Interstitien der Elytren deutlich sichtbar punktuliert. Tangentiallinien der Vorderbrust verlaufen fast parallel, die der Hinterbrust fehlend oder nur schwach angedeutet . . . . . . *niger* sp. n.
— Tibien gegen die Spitze nicht auffallend erweitert, keine Zahnbildung der Mittel- und Hintertibien. Interstitien der Elytren so schwach und zart punktuliert, dass sie fast glatt erscheinen. Tangentiallinien : die der Vorderbrust nach vorn konvergierend, Tangentialfigur daher glockenförmig, die der Hinterbrust gut sichtbar ausgebildet . . . . *pallidicornis* Arrow

Amblyopus cinctipennis trimaculatus ssp. n.

Länge 6,2 mm., Breite 3,2 mm.

Die Rasse unterscheidet sich von der von Arrow 1925 (p. 95) erneut beschriebenen und abgebildeten Nominatform dadurch, dass die Flügeldecken in vollem Umfange schwarz sind und nicht mehr ringsherum von einem gelben Band umflossen werden. Trotz dieser Verdunklung sind die Epipleuren in ihrer ganzen Länge rotbraun. Die

Unterseite des Körpers ist ebenfalls dunkler als bei der Nominatform. Von der Grundlinie des Mesosternum ist nach vorn alles rötlich-braun, nach hinten alles schwarz bis braun-schwarz. Dementsprechend sind auch die Beine der Vorderbrust rötlich-braun, die Mittel- und Hinterbeine braunschwarz. Die Tangentiallinien der Vorderbrust sind verglichen mit denen der Nominatform etwas länger. Von besonderem Interesse ist, dass sich im Zoologischen Museum zu Berlin unter den insgesamt 35 Exemplaren der Nominatform 1 Exemplar von Ceylon befindet, welches farblich auffallend in Richtung der neuen Rasse tendiert und somit eine Mittelstellung zwischen beiden Rassen einnimmt. Bei ihm ist die Unterseite gleichwie bei *trimaculatus* von der Grundlinie des Mesosternum bis zur Spitze in voller Breite dunkel (ohne seitliche, ± ausgedehnte rote Einfassung wie bei *cinctipennis*), die Flügeldecken sind nur basal ein kurzes Stück längs der Naht und der Aussenkante gelb eingefasst, im übrigen ist die gelbe Umrahmung bis auf die rötlich-gelbe Aussenkante verschwunden. Die kürzeren Tangentiallinien der Vorderbrust und die Gelbfärbung aller Beinpaare entsprechen denen der Nominatform.

Der Holotypus stammt aus der coll. Kuhnt, der die Rasse seinerzeit zwar als *nigripennis* benannt und auch mit einem Typus-Etikett versehen, aber nicht mehr beschrieben hat. Da der Name inzwischen von Arrow für eine andere Art der Gattung *Amblyopus* vergeben ist, bezeichne ich die Rasse als *A. c. trimaculatus* ssp. n.

Holotypus im Zoologischen Museum, Berlin. Fundort : Mandar.

SCELIDOPETALON nom. nov. pro ***PETALOSCELIS*** Gorh., 1896
(nec Bergroth, 1893)

Im Jahre 1945 hat Arrow (p. 117) festgestellt, dass der von Gorham 1896 zur Bezeichnung einer Erotyliden-Gattung aufgestellte Name *Petaloscelis* praeokkupiert ist, da 3 Jahre früher Bergroth den gleichen Namen für eine Rhynchoten-Gattung gewählt und publiziert hat. Eine Neubenennung hat Arrow nicht vorgenommen, da er die Gattung *Petaloscelis* als synonym zu *Amblyscelis* Gorh. (1888) ansah. Beide Gattungen sind jedoch grundverschieden. Ein unfehlbares und von Arrow selbst in seiner Bestimmungstabelle (1925, p. 92) verwandtes Unterscheidungsmerkmal stellt die Fazettierung der Augen dar, die bei allen Arten von *Amblyscelis* grob, bei denen von *Petaloscelis* sehr fein ist. Das von Gorham errichtete Genus muss daher erhalten bleiben und mit einem neuen Namen versehen werden. Ich schlage als nomen novum " *Scelidopetalon* " vor, um die Kennzeichnung der plattenförmig verbreiterten Tibien beizubehalten, durch die sich der Genotypus *S. instabile* Gorh. auszeichnet.

Scelidopetalon arrowi sp. n.
(Abb. 1 und 2)

Länge 4,8–5,2 mm., Breite 2,9–3,2 mm.

Körper gewölbt, Färbung rot, nur die Elytren mit Ausnahme einer basalen roten Makel (Abb. 1 + 2) schwarz und die Fühler vom 6. bis zur basalen Hälfte des 11. Gliedes dunkelbraun bis schwarz. Bei 3 Exemplaren ist auf dem roten

Halsschild auf der Mitte des Basalteiles oberhalb des Schildchens ein Anflug von Schwarzfärbung zu konstatieren. Kopf und Halsschild sehr fein und weitläufig punktiert, glänzend. Clypeus vorn dreieckig ausgeschnitten. Halsschild: Seiten gerundet und fein gerandet, der Vorderrand in der Mitte leicht vorgezogen, leicht konvex, Vorderecken verrundet, Hinterecken stumpfwinklig mit grossem Porenpunkt. Flügeldecken glänzend mit stark eingeritzten Punktstreifen, von denen die ersten 5 bis zur Basis durchlaufen, der 6. bis 8. vor oder auf der Schulterbeule endet und der 9. nur im vorderen Drittel entwickelt ist. Die Abbildungen 1 + 2 zeigen die beiden Extreme, zwischen denen Form und Ausdehnung der roten Elytren-Makeln schwanken. Scutellum zart punktuliert, Länge : Breite wie 1 : 1,5. Prosternum median im vorderen Teil schwach gekielt, der Vorderrand in der Mitte winklig vorspringend. Tangentiallinien aller 3 Hüftpaare vorhanden, die der Vorderbrust erstrecken sich über ⅔ von deren Länge, verlaufen im vorderen Teil fast parallel und sind an der Spitze hakenförmig einwärts gebogen. Fühler gleich der von Arrow für *instabile* Gorh. abgebildeten Form (1295, p. 101, Fig. 20) kurz und gedrungen, das 3. Glied so lang wie das 4. + 5. zusammen, das 4. — 7. perlförmig, das 8. quer, die Fühlerkeule stark abgesetzt und ihre Glieder sehr kurz und breit (strongly transverse). Die Tibien gegen die Spitze auffallend verbreitert. Endglied des Maxillar-Palpus ca 1½ mal so breit wie lang. Die Lacinia unbewehrt.

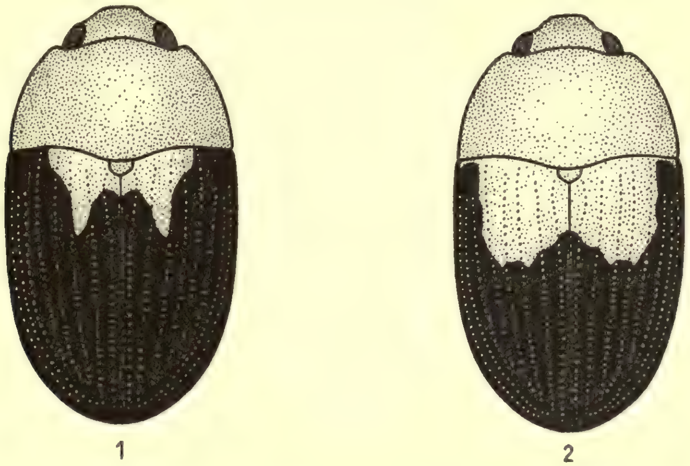


Abb. 1 und 2. *Scelidopetalon arrowi* sp. n. von Singapore. Die Elytrenmakeln beider Vertreter stellen die Extreme dar, zwischen denen beim vorliegenden Material Form und Ausdehnung schwanken.

Die Art ähnelt dem von Gorham beschriebenen und von Arrow (1925, p. 101, fig. 20) abgebildeten *instabile* weitgehend. Dieses unterscheidet sich von ihr durch folgende Merkmale: Es ist flacher, nicht so gewölbt. Kopf und Halsschild sind dichter punktiert und zumeist mit schwarzen Flecken versehen. Die rote Makel der Flügeldecken hat X-förmige Gestalt.

Holotypus im Britischen Museum, London. Fundort : Singapore, C. F. Baker, 1918.

8 Paratypen. Fundort : Singapore, coll. Pascoe (1 Expl.), C. F. Baker 1918 (1 Expl.), C. J. Saunders 1922 (3 Expl.) und ohne Angabe des Sammlers (3 Expl.).

Aulacochilus biplagiatus sp. n.

Länge 9 mm., Breite 4,2 mm.

Die glänzend schwarze Art unterscheidet sich von den bisher bekannten Arten der Gattung *Aulacochilus* auf den ersten Blick dadurch, dass die Elytren im Spitzenteil je einen länglichen gelben Fleck aufweisen, der sich über etwas mehr als ⅓ der Flügeldeckenlänge erstreckt und in der Breite schwankend kurz vor der Spitze, die er nicht erreicht, zwischen 1. und 8. und im vorderen Teil zwischen 3. und 8. Punktstreifen liegt. Clypeus dicht, Stirn weitläufiger punktiert. Halsschild in der Mitte sehr zart und weitläufig, auf beiden Seiten kräftiger und dichter punktiert, die Seiten kräftig gerandet, kurz vor der Spitze einwärts gebogen, im übrigen Teil fast gerade und zur Basis divergierend verlaufend. Flügeldecken mit gut sichtbaren, aber nicht kräftigen Punkstreifen versehen. 3. Fühlerglied nicht ganz so lang wie das 4. + 5. (9 : 10), Glied 4 — 8 perlförmig, Fühlerkeule fast doppelt so lang wie breit (18 : 10). Tangentiallinien aller 3 Hüftpaare vorhanden, die der Vorderbrust erstrecken sich über fast ¾ von deren Länge, sind zur Spitze einwärts gebogen und weit voneinander getrennt, so dass eine breite glockenförmige Tangentialfigur entsteht. Die Vorderbrust ist in der Mitte unpunktiert, auf beiden Seiten wie bei den *Aulacochilus*-Arten üblich sehr grob punktiert, in der Mitte nicht gekielt, ohne knopfförmige Spitze in der Mitte des Vorderrandes, dieser vielmehr gleichförmig gerundet, in der Mitte vor der Tangentialfigur höchstens ganz schwach konvex. Endglied der Maxillarpalpen beilförmig, relativ klein und etwa doppelt so breit wie lang (15 : 7).

Holotypus im Britischen Museum, London. Fundgebiet : Philippinen.

Aulacochilus erythroperonus quadriplagiatus ssp. n.

(Abb. 3)

Länge 7,5–9,5 mm., Breite 3,5–4,5 mm.

Die Rasse unterscheidet sich von der Nominatform lediglich dadurch, dass der rote Längsstreifen auf den schwarzen Flügeldecken jeweils auf ein kurzes Basal- und Apikalstück reduziert ist (Abb. 3). Das Basalstück verläuft im 5. Interstitium in einer Ausdehnung von ca doppelter Länge der Schulterbeule, biegt alsdann hakenförmig in das 4. Interstitium ein und erlischt hier. Der rote Apikalfleck steht kurz vor der Spitze der Flügeldecken, ist von wechselnder Breite und kann vom 4. Insterstitium nach aussen bis in das 5., nach innen bis in das 2. Interstitium reicher. Gleichwie bei der Nominatform ist auch bei *quadriplagiatus* auf beiden

Seiten des Halsschildes ein Anflug von Rotfärbung ± deutlich erkennbar. Weitere Rotfärbungen sind auf der Oberseite nicht vorhanden. Im übrigen entspricht die Rasse vollauf der Nominatform, so dass sich eine Wiederholung meiner für diese 1935 gegebenen Beschreibung erübrigt.

Holotypus im Britischen Museum, London. Fundort : NW. Rhodesien, Kashitu, N. of Broken Hill, xi.1914, H. C. Dollman.

2 Paratypen vom gleichen Fundort, iv.1915.

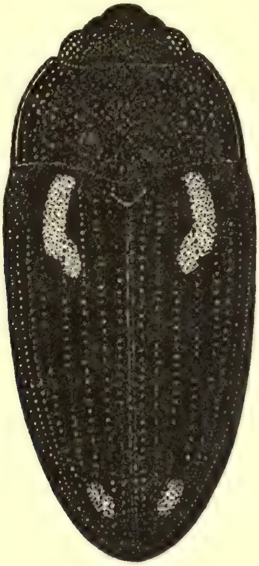


ABB. 3. *Aulacochilus erythroperonus quadriplagiatus* ssp. n. von Rhodesien : Kashitu.

Aulocochilus capensis Lacord. (1842) = **angolensis** Schklg. (1919) [SYN. NOV]

Ein Vergleich des im Deutschen Entomologischen Institut befindlichen Typus von *Aulacochilus angolensis* Schklg. mit Vertretern von *Aulacochilus capensis* Lacord. ergab, dass beide Arten identisch sind. Die von Schenkling (1919, p. 78) hervorgehobene unterschiedliche Punktierung auf Halsschild, Brust und Abdomen sowie das unterschiedliche Ausmass der Verschmälerung des Körpers gegen das Hinterende bei beiden Arten erweisen sich als nicht stichhaltig. Ob rassische Verschiedenheiten zwischen den Vertretern von Angola auf der einen Seite und denen des südlichen und östlichen Afrika auf der anderen Seite vorhanden sind, lässt sich z. Zt. nicht festellen, da von Angola nur ein einziges Exemplar vorliegt. Zu den von mir im Jahre 1933 (p. 141) angegebenen Fundorten für die Art kommen folgende hinzu : Angola : Bailundo (1 Expl.) und Rhodesien (A. Bodong, 3 Expl.). Alle 4 Exemplare befinden sich im Deutschen Entomologischen Institut zu Berlin.

Aulacochilus murrayi (Crotch)—nec *Amblyopus*

Länge 7,8 mm., Breite 3,8 mm.

Die Untersuchung des Typus ergab die überraschende Feststellung, dass Crotch bei Eingliederung der von ihm vor 81 Jahren beschriebenen Art *murrayi* in die Gattung *Amblyopus* ein Irrtum unterlaufen ist. Sie stellt einen echten Vertreter der Gattung *Aulacochilus* dar und gehört somit zur Unterfamilie Encaustinae und nicht zu den Tritominae. Alle für die Gattung *Aulacochilus* massgeblichen Merkmale finden sich bei *murrayi* realisiert, so dass an seiner Unterbringung bei dieser Gattung kein Zweifel besteht. Nach Beschreibung des ersten afrikanischen Vertreters der in der orientalischen Region nach bisherigen Befunden weit artenreicheren Gattung *Aulocochilus* seitens Lacordaire im Jahre 1842 (*capensis* Lac.) stellt der 34 Jahre später beschriebene *murrayi* den zweiten bekannt gewordenen Vertreter der Gattung dar, der nur infolge einer falschen Eingruppierung erst heute als solcher in Erscheinung tritt.

Zu der von Crotch gegebenen Beschreibung sind folgende Ergänzungen hinzuzufügen. Kopf und Halsschild rotbraun, Unterseite rötlich, Elytren gelb (Westafrikaner) mit 3 braunen bis braunschwarzen Längsstreifen und einer ebenso gefärbten Schultermakel. Der Nahtstreifen ist 2 Interstitien breit, greift in seinem frontalen Verlauf ± auf das 3. Interstitium über und erweitert sich unmittelbar vor der Basis—weit ausladend—bis zum 4. Punkstreifen ; apikal erreicht er nicht die Spitze, sondern erlischt kurz vor ihr. Die weite Ausladung des Nahtstreifens vor der Basis der Flügeldecken kommt dadurch zustande, dass er sich hier—wie vergleichsweise Exemplare von *A. sexguttatus* Delk. deutlich demonstrieren—mit einem im 4. Interstitium befindlichen Fleck vereinigt. Gleichwie bei *sexguttatus* werden zweifellos auch bei *murrayi* Exemplare vorkommen, die Übergänge sichtbarer Trennung von Nahtstreifen und Fleck über beginnende Vereinigung bis zu völliger Verschmelzung beider Zeichnungselemente aufweisen und die Entstehung der auffallenden Erweiterung des Nahtstreifens vor der Basis verständlich machen. Der Mittelstreifen beginnt mit dem 2. Viertel vor der Mitte der Elytren und erlischt vor der Spitze in gleicher Höhe wie der Nahtstreifen. Er ist 3 Interstitien breit, reicht vom 4. bis 7. Punktstreifen, wird vor der Spitze schmaler und tritt hier in das 4. Interstitium über. Er kann als eine Verbindung der beiden dunklen Flecke angesehen werden, die bei *A. sexguttatus* Delk. im 5. Insterstitium stehen, der eine vor der Mitte, der andere kurz vor der Spitze der Flügeldecken. Der Seitenstreifen füllt den Raum vom 9. Punktstreifen bis zur Seitenkante aus, reicht von der Basis bis zur Spitze, biegt hier hakenförmig nach vorn um, eine kurze Strecke längs der Naht vorstossend, ohne jedoch den breiten Nahtstreifen zu erreichen. Der dunkle Fleck der Schulterbeule reicht vom 5. bis 7. Punktstreifen. Halsschild auf der Mitte zarter und weitläufiger, auf beiden Seiten viel kräftiger und dichter punktiert, glänzend.

Holotypus im Britischen Museum, London. Fundort : Old Calabar, Murray.

Aulacochilus sexguttatus Delk. (1933) = ***interruptus*** Deelder (1942) [SYN. NOV.]

In der taxonomischen Beurteilung der als "*Amblyopus murrayi* Crotch var. *interruptus* nov." beschriebenen Varietät ist Deelder ein zweifacher Irrtum unterlaufen. (1.) Gleichwie *murrayi* Cr. gehört auch var. *interrupta* Deelder nicht zur Gattung *Amblyopus*, sondern zur Gattung *Aulacochilus*, also nicht zur Subfamilie Tritominae, sondern zu den Encaustinae. (2.) Var. *interrupta* Deelder stellt kein novum für die Wissenschaft dar, sondern ist identisch mit dem von mir 1933 beschriebenen *Aulacochilus sexguttatus* und verfällt somit der Synonymie. Zu diesen Feststellungen gelangte ich auf Grund des günstigen Umstandes, dass ich die Typen obiger Namensträger persönlich untersuchen und miteinander vergleichen konnte. Ich registriere daher wie folgt :

Aulacochilus sexguttatus Delk. (1933)
= *interruptus* Deelder (1942) (nec *Amblyopus*)

Ob *sexguttatus* Delk. (= *interruptus* Deelder) als eigene Art oder als eine Varietät von *murrayi* Cr. (sensu Deelder) anzusehen ist, lässt sich z. Zt. nicht entscheiden, da (1.) von *murrayi* nur ein einziges Exemplar vorliegt und (2.) als Herkunft dieses Exemplares " Old Calabar (Murray) ;" verzeichnet ist, ein Fundort, der sich schon des öfteren zum mindesten als fragwürdig erwiesen hat. Ich selbst möchte *sexguttatus* vorerst als selbständige Art ansehen und zwar aus folgenden Gründen : Im Vergleich zu *murrayi* ist der Halsschild von *s.* weniger glänzend, matt, der Seitenrand weniger gebogen, die Seitenteile und ebenso die Punktstreifen der Elytren sind schwächer punktiert. Sämtliche 10 mir vorliegenden Exemplare von *s.* (6 von Kamerun und 4 von Belg.-Congo : Mayumbe) erweisen sich in den angeführten Merkmalen als konstant, kein einziges von ihnen zeitigt Übergänge oder gar Übereinstimmung mit *murrayi.* Das gleiche gilt für die Elytrenzeichnung.

Holotypus im Rijksmuseum van Natuurlijke Historie, Leiden.

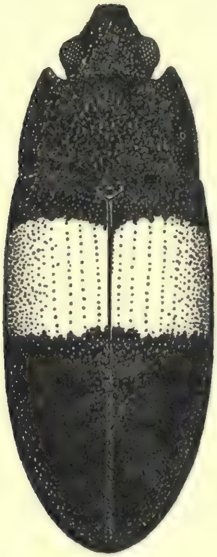
Tamboria coerulea sp. n.

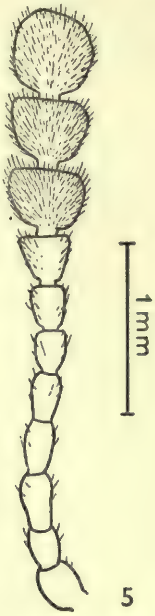
(Abb. 4 *u.* 5)

Länge 8–9 mm., Breite 3,2–3,6 mm.

Im Jahre 1944 berichtete Arrow (p. 53) von " association between geographical distribution and coloration " und teilt seine sowohl bei Erotyliden wie auch bei Coccinelliden und Halticiden gemachte Beobachtung mit, indem er sagt : " Blue or metallic colours in the Papuan species generally replace the black ground colour of most Indo-malayan representatives ". Wenn auch die vorliegende neue Art nicht zum Nachlass von Arrow gehört, sondern Eigentum des Berliner Zoologischen Museums ist und diesem in liebenswürdiger Weise von Herrn Leopold Mader, Wien, dediziert wurde, wofür ich ihm auch an dieser Stelle meinen herzlichsten Dank ausspreche, so lasse ich gleichwohl ihre Neubeschreibung an dieser Stelle folgen, da sie einen weiteren eindeutigen Beweis für die Richtigkeit der von Arrow getroffenen Feststellung liefert. Zur Unterfamilie Dacninae gehörig, hebt sie sich durch ihre leuchtend metallisch blaue Färbung in so auffallender Weise von den ausnahmslos schwarzen Vertretern der orientalischen Region ab, dass sie auf den ersten Blick ihre Zugehörigkeit zur australischen Region erkennen lässt.

Körper langgestreckt, schlank. Färbung metallisch blau mit einem breiten gelben Band auf den Elytren (Abb. 4), das sich quer über deren ganze Breite bis zu den Aussenkanten zieht, auf die Epipleuren aber nicht übergreift, so dass diese in ihrer ganzen Länge blau bleiben. Kopf im vorderen Teil dichter, im hinteren Teil weitläufiger punktiert, ohne Stridulationsleisten im hinteren Teil. Halsschild: basal in seiner ganzen Breite, frontal nur von den Vorderwinkeln bis kurz hinter den Innenrand der Augen fein gerandet; basal auf beiden Seiten oberhalb des 4. Interstitium der Elytren mit je einem flachen Grübchen und einigen grösseren Punkten; Seitenrand schmal, kurz vor der Spitze etwas verbreitert und in den Vorder- und Hinterwinkeln mit je einem grösseren Porenpunkt; Vorderecken etwas vorgezogen. Scutellum zart punktiert, stark quer, Länge: Breite wie 1 : 1,75. Elytren ohne Basalrandung und mit sehr feinen Punktstreifen, die nur auf der gelben Querbinde gut sichtbar sind. Fühler (Abb. 5) kräftig, das 3. Glied etwas länger als das 4. (10 : 8), das 4. bis 7. gestreckt, länger als breit, das 8. als Übergangsglied dreieckig verbreitert, aber noch nicht die dichte weisslich-graue Behaarung aufweisend, durch die sich die 3 Glieder der Fühlerkeule auszeichnen und sichtbar von den übrigen abheben. Tangentiallinien aller 3 Hüftpaare fehlen. Vorderbrust


4



5

Abb. 4. *Tamboria coerulea* sp. n. von Brit. N. Guinea: Edie Creek.

Abb. 5. *Tamboria coerulea* sp. n., rechter Fühler.

gleichmässig gerundet mit geradem Vorderrand, nicht gekielt, seitlich gröber als auf der Mitte punktiert. Hinterbrust: ihr Vorderrand zwischen den Mittelhüften konkav, kurz hinter dem Vorderrand mit einer Querdepression; auf der Mitte mit einem feinen Längsgrat, der kurz vor der Querdepression in die fein eingekerbte Rinne einer Längsdepression einmündet. Lacinia gleich wie bei *Neothallis* Fauv. mit 2 sehr dicht beieinander stehenden Haken bewehrt, die bei Ventral- oder Dorsalansicht einander decken. Glossae von den Paraglossae erheblich überragt. Endglied der Maxillartaster zugespitzt, das der Labialtaster beilförmig verbreitert und nicht mit der Mitte, sondern seitlich dem 2. Gliede aufsitzend. Mentum gross, dreieckig, stark quer, doppelt so breit wie lang. Augen im Gegensatz zu denen bei *Episcapha* Lac. und *Episcaphula* Cr. auffallend klein, in der Stärke der Fazettierung ihnen entsprechend. Beine schlank; Tarsenglieder schmal, mit behaarter Unterseite, das 4. Tarsenglied sehr klein, das 3. nur wenig überragend.

Die Art zeigt in ihren wesentlichen Merkmalen mit der von Heller 1920 (p. 62) beschriebenen *Tamboria sumbavana*, deren Typus ich dank des liebenswürdigen Entgegenkommens von Herrn R. Reichert, Dresden, vergleichend untersuchen konnte, eine so weitgehende Übereinstimmung, dass der grösste Teil der oben hervorgehobenen Merkmale auch für *sumbavana* zutrifft und ich somit nicht zögere, *coerulea* der Gattung *Tamboria* zuzuordnen. Abgesehen von der Färbung und Zeichnung (Elytren mit je 2 gelben Makeln auf schwarzem oder braunem Grund) unterscheidet sich *sumbavana* von *coerulea* im wesentlichen durch folgende Merkmale: sie ist schlanker, läuft nach hinten spitzer zu. Der Seitenrand des Halsschildes ist kurz vor den Vorderecken weit auffallender verbreitert. Die Elytren sind basal fein gerandet. Die Glieder 5–7 der Fühler sind perlförmig, die Glieder der Fühlerkeule kürzer. Die Hinterbrust ist im vorderen Teil ohne Längs- und Querdepression, aber median ebenfalls mit einem feinen Längsgrat versehen. Das Mentum ist kürzer.

Holotypus im Zoologischen Museum, Berlin. Fundort: Brit. N. Guinea, Edie Creek, 7,000 Fuss.

2 Paratypen vom gleichen Fundort.

VERZEICHNIS DER NEUBESCHREIBUNGEN

1. *Amblyopus palliditarsis* sp. n.	Tonkin.
2. *Amblyopus niger* sp. n.	India or.: Nagpore.
3. *Amblyopus cinctipennis* Lac. ssp. *trimaculatus* n.	Celebes: Mandar.
4. *Scelidopetalon arrowi* sp. n.	Singapore.
5. *Aulacochilus biplagiatus* sp. n.	Philippinen.
6. *Aulacochilus erythroperonus* Delk. ssp. *quadriplagiatus* n.	NW. Rhodesien: Kashitu.
7. *Tamboria coerulea* sp. n.	Brit. N. Guinea: Edie Creek.

SYSTEMATISCHE BERICHTIGUNGEN

1. *Scelidopetalon* n. n.
   pro *Petaloscelis* Gorh. 1896 (nec Bergroth, 1893).
   Genotypus: *S. instabile* Gorh.

2. *Aulacochilus capensis* Lac. (1842)
   = *angolensis* Schklg. (1919). [SYN. NOV.]
3. *Aulacochilus murrayi* Crotch (nec *Amblyopus*).
4. *Aulacochilus sexguttatus* Delk. (1933)
   = *interruptus* Deelder (1942) [SYN. NOV.]
   (nec *Amblyopus*).

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(Es sind nur diejenigen Literaturzitate angegeben, die im Coleopterorum Catalogus von JUNK und SCHENKLING vol. XV, ps. 34, 1911 Erotylidae nicht mehr verzeichnet sind.)

BRITISH MUSEUM 20 DEC 1957 NATURAL HISTORY

LECTOTYPES OF TRICHOPTERA FROM THE McLACHLAN COLLECTION NOW IN THE BRITISH MUSEUM (NATURAL HISTORY)

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20 DEC 1957
NATURAL HISTORY

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LECTOTYPES OF TRICHOPTERA FROM THE McLACHLAN COLLECTION NOW IN THE BRITISH MUSEUM (NATURAL HISTORY)

By D. E. KIMMINS

IN common with other workers of his time, the distinguished " Neuropterist " Robert McLachlan, when describing a new species from more than one example, did not normally indicate a single specimen as the " type " of the species, but placed " Type " labels on all (or at least some) of that series upon which he was working. At various times, types have been designated for certain species, and it has now been considered desirable to collect together such information and to republish it together with designations of lectotypes for other species in his collection not already dealt with. In most cases the species concerned were described by McLachlan himself, but in the later years of his life he sent material to the Rev. A. E. Eaton and to Mr. K. J. Morton for study, and lectotypes of species described by these authors have also been included.

The McLachlan Collection was purchased by the British Museum (Natural History) in 1938, upon the death of Mr. H. McLachlan, nephew of the entomologist. Mr. Martin E. Mosely was then in charge of the Trichoptera at the British Museum (Nat. Hist.) and undertook the incorporation of the McLachlan Trichoptera into the main Museum Collections. McLachlan kept two collections, one of European and exotic material and one of British Trichoptera. Specimens in the latter collection bore no locality labels, but only a small, circular label with two numbers on it, referring to the year and accession number in his accession register, in which was entered details of locality, date, captor, etc. This register fortunately came to the Museum with his collection and details from it have been printed or transcribed and attached to the specimens.

Before incorporation of material from either collection, the following labels were attached to the specimens by Mosely. A printed B.M. registration label on blue paper, " McLachlan Coll., B.M. 1938–674 " and in most cases also a printed label on blue paper, giving the name over which it was found in the McLachlan Collection.

McLachlan usually indicated his type-series with minute labels on pink or mauve paper, with the word " Type " printed on them. I do not think that the actual colour of the paper had any special significance. Standard British Museum type-labels (as used in the Entomological Dept.)—a circular label with the word " Type " encircled with a red ring—have since been added by Mosely or myself, and in the case of species dealt with in this paper I have added my own label, LECTOTYPE or LECTOALLOTYPE, D. E. Kimmins det. 1956. The species are dealt with under their original generic-specific combinations and the present combination, if different, is indicated under the original combination and is also cross-indexed under the present combination. This has been done because the original combination is fixed and definite, whereas the present combination is sometimes a matter of opinion. Species are arranged alphabetically under genus and species in families.

Family RHYACOPHILIDAE

Agapetus pactus McLachlan, 1879, p. 481.

Kimmins, 1949, p. 37 (♂ holotype, ♀ allotype = LECTOTYPE ♂ and LECTOALLOTYPE ♀).

Synonym of *Agapetus laniger* (Pictet).

Agapetus celatus McLachlan, 1871, p. 139.

Kimmins & Denning, 1951, p. 112 (Type ♀ = LECTOTYPE ♀).

Agapetus delicatulus McLachlan, 1884, p. 67.

LECTOTYPE ♂. Pyrenees, 16/6. Eaton, 1878. B.M. 1938–674. Printed label (blue), Agapetus delicatulus McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Agapetus nimbulus McLachlan, 1879, p. 479.

LECTOTYPE ♂. McL. type-label (mauve). Bourg d'Oisans. Label in McL.'s writing, *Agapetus nimbulus McL.* B.M. 1938–674. Printed label (blue), Agapetus nimbulus McLach., det. McLachlan.

This specimen has had the abdomen removed, cleared and placed in a small tube of glycerine.

Catagapetus nigrans McLachlan, 1884, p. 68.

LECTOTYPE ♂. McL. type-label (pink). Apennino Pistojese, Eaton, 1882. 27.vii.82. Label in McL.'s writing, *Catagapetus nigrans McL.* B.M. 1938–674. Printed label (blue), Catagapetus nigrans McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Glossosoma privatum McLachlan, 1884, p. 65.

LECTOTYPE ♂. McL. type-label (mauve). Villa Real, 24/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Glossosoma privatum McL.* Printed label (blue), Glossosoma privatum McLach., det. McLachlan.

Glossosoma spoliatum McLachlan, 1879, p. 473.

LECTOTYPE ♂. McL. type-label (mauve). Pau, 18/6. Eaton, 1878. Label in McL.'s writing, *Glossosoma spoliatum McL.* B.M. 1938–674. Printed label (blue), Glossosoma spoliatum McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Hydrobiosis frater McLachlan, 1868*a*, p. 207.

LECTOTYPE ♂. Christchurch, N.Z., Fereday. Label in McL.'s writing, *Hydrobiosis frater McL.* B.M. 1938–674. LECTOALLOTYPE ♀. Same data.

Lectotype ♂ with right wings between celluloid sheets, abdomen mounted in canada balsam, lectoallotype ♀ with abdomen mounted in canada balsam.

Hydrobiosis umbripennis McLachlan, 1868*a*, p. 208.

Mosely & Kimmins, 1953, p. 413 (Type ♂ = LECTOTYPE).

LECTOALLOTYPE ♀. Christchurch, N.Z., Fereday. Label in McL.'s writing, *Hydrobiosis umbripennis McL.* B.M. 1938–674.

Right wings between celluloid sheets, abdomen mounted in canada balsam.

Neurochorema confusum (McLachlan). See ***Psilochorema.***

Pseudagapetus diversus McLachlan, 1884, p. 67.

LECTOTYPE ♂. McL. type-label (mauve). Cea, 4/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Pseudagapetus diversus McL.* B.M. 1938–674. Printed label (blue), Pseudagapetus diversus McLach., det. McLachlan. LECTOALLOTYPE ♀. Villa Real, 22/6, otherwise as in male.

The lectotype ♂ now lacks its head.

Present combination. *Synagapetus diversus* (McL.).

Pseudagapetus insons McLachlan, 1879, p. 487.

LECTOTYPE ♂. McL. type-label (mauve). Pyrenees, 6/6. Eaton, 1878. Label in McL.'s writing, *Pseudagapetus insons McL.* B.M. 1938–674. Printed label (blue), Pseudagapetus insons McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Synagapetus insons* (McLachlan).

Psilochorema confusum McLachlan, 1868*a*, p. 210.

LECTOTYPE ♂. New Zealand. Label in McL.'s writing, *Psilochorema confusum McL., Type.* B.M. 1938–674. LECTOALLOTYPE ♀. Same data.

The lectotype now lacks both anterior and left posterior wings, the lectoallotype both left wings.

Present combination. *Neurochorema confusum* (McL.).

Psilochorema mimicum McLachlan, 1866*b*, p. 274.

Mosely & Kimmins, 1953, pp. 426–428 ((Type ♂ = LECTOTYPE ♂).

LECTOALLOTYPE ♀. N. Zeal., 54.4.

None of the type-series bears a determination label by McLachlan, that on the lectotype ♂ being in W. F. Kirby's writing.

Ptilocolepus extensus McLachlan, 1884, p. 70.

Lectotype ♂. McL. type-label (mauve). Cea, 11/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Ptilocolepus extensus McL.* B.M. 1938–674. Printed label (blue), Ptilocolepus extensus McLach., det. McLachlan. Lectoallotype ♀. Same data.

Rhyacophila adjuncta McLachlan, 1884, p. 63.

Lectotype ♂. McL. type-label (mauve). Villa Real, 25/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Rhyacophila adjuncta McL.* B.M. 1938–674. Printed label (blue), Rhyacophila adjuncta McLach., det. McLachlan. Lectoallotype ♀. Date, 23/6, otherwise as in male.

The lectotype has had the right clasper removed (? by McLachlan).

Rhyacophila albardana McLachlan, 1879, p. 437.

Lectotype ♂. McL. type-label (mauve). La Grave. Label in McL.'s writing, *albardana McL.* B.M. 1938–674. Printed label (blue), Rhyacophila albardana McLach., det. McLachlan. Lectotype ♀. Same data.

Lectotype with right clasper missing.

Rhyacophila aquitanica McLachlan, 1879, p. 457.

Lectotype ♂. McL. type-label (mauve). Mt. Mezenc, 2/8. Eaton, 1878. Label in McL.'s writing, *aquitanica McL.* B.M. 1938–674. Printed label (blue), Rhyacophila aquitanica McLach., det. McLachlan. Lectoallotype ♀. Same data.

Rhyacophila contracta McLachlan, 1879, p. 449.

Lectotype ♂. McL. type-label (mauve). Pyrenees, 12/6. Eaton, 1878. Label in McL.'s writing, *contracta McL.* B.M. 1938–674. Printed label (blue), Rhyacophila contracta McLach., det. McLachlan. Lectoallotype ♀. Same data.

Rhyacophila denticulata McLachlan, 1879, p. 443.

Lectotype ♂. McL. type-label (mauve). Pyrenees, 2/7. Eaton, 1878. Label in McL.'s writing, *denticulata McL.* B.M. 1938–674. Printed label (blue), Rhyacophila denticulata McLach., det. McLachlan. Lectoallotype ♀. Same data, except date, 21/6.

Rhyacophila eatoni McLachlan, 1879, p. 463.

Lectotype ♂. McL. type-label (mauve). Pyrenees, 6/6. Eaton, 1878. Label in McL.'s writing, *eatoni McL.* B.M. 1938–674. Printed label (blue), Rhyacophila eatoni McLach., det. McLachlan. Lectoallotype ♀. Same data.

Rhyacophila evoluta McLachlan, 1879, p. 438.

LECTOTYPE ♂. McL. type-label (mauve). Le Lioran, 27/7. Eaton, 1878. Label in McL.'s writing, *evoluta McL.* B.M. 1938–674. Printed label (blue), Rhyacophila evoluta McLach., det. McLachlan.

Rhyacophila fraudulenta McLachlan, 1879, p. 450.

LECTOTYPE ♂. McL. type-label (mauve). Le Lioran, 25/7. Eaton, 1878. Label in McL.'s writing, *fraudulenta McL.* B.M. 1938–674. Printed label (blue), Rhyacophila fraudulenta McLach., det. McLachlan.

The two paratypes from Monte Rosa, collected by Staudinger, are no longer in the McLachlan collection.

Rhyacophila glareosa McLachlan, 1867, p. 62.

LECTOTYPE ♂. McL. type-label (mauve). Stelzing, Jul. 61. 23. Zeller. Label in McL.'s writing, *glareosa* (*Type*). B.M. 1938–674. Printed label (blue), Rhyacophila glareosa McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data but no number (23).

Rhyacophila hageni McLachlan, 1879, p. 447.

LECTOTYPE ♂. McL. type-label (mauve). Altvater. Label in McL.'s writing, *hageni McL.* B.M. 1938–674. Printed label (blue), Rhyacophila hageni McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Rhyacophila intermedia McLachlan, 1868, p. 306.

LECTOTYPE ♂. McL. type-label (pink). Bruck a/M., Aug. 67. Label in McL.'s writing, *intermedia McL.* B.M. 1938–674. Printed label (blue), Rhyacophila intermedia McLach., det. McLachlan.

Rhyacophila lusitanica McLachlan, 1884, p. 63.

LECTOTYPE ♂. McL. type-label (mauve). Cea, 9/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Rhyacophila lusitanica McL.* B.M. 1938–674. Printed label (blue), Rhyacophila lusitanica McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Rhyacophila munda McLachlan. 1862, p. 309.

Kimmins, 1949, p. 37 (♂ type = LECTOTYPE ♂).

Rhyacophila obliterata McLachlan, 1863*b*, p. 134.

Kimmins, 1949, p. 37 (♂ type = LECTOTYPE ♂).

Rhyacophila obtusidens McLachlan, 1879, p. 440.

LECTOTYPE ♂. Pyrenees, 30/5. Eaton, 1878. B.M. 1938–674. Printed label (blue), Rhyacophila persimilis McLach., det. McLachlan.

In his original description, McLachlan quotes examples from Gave de Pau, Orthez, Basses Pyrenees, 30th May and Défilé de Pierre Lis, near Quillan, Aude, Eaton. He also mentions " Switzerland (stated by Meyer-Dur to be general and to occur from the beginning of March up to the end of November) ". This quotation suggests that McLachlan had no actual specimens from Switzerland at that time. He certainly received some later, one of which is dated 5/92, the others without year date. If, as I believe, they were all received subsequently, then the type-series must be those quoted above, and in 1880, p. lxxv, he transfers these specimens to *R. persimilis*, which explains the *persimilis* determination label. Both *obtusidens* and *persimilis* are now considered to be synonyms of *R. dorsalis* Curtis.

Rhyacophila occidentalis McLachlan, 1879, p. 438.

LECTOTYPE ♂. McL. type-label (mauve). Pyrenees, 8/6. Eaton, 1878. Label in McL.'s writing, *occidentalis McL.* B.M. 1938–674. Printed label (blue), Rhyacophila occidentalis McLach., det. McLachlan.

Rhyacophila persimilis McLachlan, 1879, p. 440.

LECTOTYPE ♂. Königsee, Brauer. B.M. 1938–674. Printed label (blue), Rhyacophila persimilis McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data. See remarks about *R. obtusidens* McL., above.

Rhyacophila philopotamoides McLachlan, 1879, p. 463.

LECTOTYPE ♂. McL. type-label (mauve). Pyrenees, 24/6. Eaton, 1878. Label in McL.'s writing, *philopotamoides McL.* B.M. 1938–674. Printed label (blue), Rhyacophila philopotamoides McLach., det. McLachlan.

Rhyacophila praemorsa McLachlan 1879, p. 447.

LECTOTYPE ♂. McL. type-label (mauve). Spa. Label in McL.'s writing, *praemorsa McL.* B.M. 1938–674. Printed label (blue), Rhyacophila praemorsa McLach., det. McLachlan.

Rhyacophila proxima McLachlan, 1880, p. lxxvi.

LECTOTYPE ♂. McL. type-label (mauve). Tanninges, Savoy, 9/9/1879. Label in McL.'s writing, *proxima McL.* B.M. 1938–674. Printed label (blue), Rhyacophila proxima McLach., det. McLachlan. LECTOALLOTYPE ♀. Samoens, 5/9/1879, other data as in male.

Rhyacophila relicta McLachlan, 1879, p. 442.

LECTOTYPE ♂. McL. type-label (mauve). Pyrenees, 17/6. Eaton, 1878. Label in McL.'s writing, *relicta McL.* B.M. 1938–674. Printed label (blue), Rhyacophila relicta McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Rhyacophila rectispina McLachlan, 1884, p. 60.

LECTOTYPE ♂. McL. type-label (pink). Val Anzasca 22.vii.82. Label in McL.'s writing, *rectispina McL.* B.M. 1938–674. Printed label (blue), Rhyacophila rectispina McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Rhyacophila rupta McLachlan, 1879, p. 450.

LECTOTYPE ♂. McL. type-label (mauve). Pyrenees, 26/6. Eaton, 1878. Label in McL.'s writing, *rupta McL.* B.M. 1938–674. Printed label (blue), Rhyacophila rupta McLach., det. McLachlan. LECTOALLOTYPE ♀. Date 20/6, otherwise as in male.

Rhyacophila septentrionis McLachlan, 1865, p. 157.

Kimmins, 1949, p. 37 (♂ type = LECTOTYPE ♂).

Synagapetus diversus (McLachlan). See ***Pseudagapetus***.

Synagapetus dubitans McLachlan, 1879, p. 484 (♀) ; 1880, p. lxxviii (♂).

HOLOTYPE ♀. McL. type-label (mauve). Autun. Label in McL.'s writing, *Synagapetus dubitans McL.* B.M. 1938–674. Printed label (blue), Synagapetus dubitans McLach., det. McLachlan. LECTOALLOTYPE ♂. St. Aubin, 29/8. B.M. 1938–674. Printed label (blue), Synagapetus dubitans McLach., det. McLachlan.

Synagapetus insons (McLachlan). See ***Pseudagapetus***.

Family PHILOPOTAMIDAE

Dolophilus copiosus McLachlan, 1868, p. 303.

LECTOTYPE ♂. McL. type-label (pink). Zeller, Carinthia. 27/5/67. Label in McL.'s writing, *copiosus McL.* B.M. 1938–674.. Printed label (blue), Dolophilus copiosus McLach., det. McLachlan. LECTOALLOTYPE ♀. McL. type-label (mauve). Date, 20/7/57. Otherwise as in male.

The lectotype has had the abdomen cleared and mounted as a microscope preparation in canada balsam.

Present combination. *Wormaldia copiosa* (McL.).

Dolophilus corvinus McLachlan, 1884, p. 49.

LECTOTYPE ♂. McL. type-label (mauve). Cea, 9/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Dolophilus corvinus McL.* B.M. 1938-674. Printed label (blue), Dolophilus corvinus McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

The lectotype has had the abdomen removed, cleared and mounted as a microscope preparation.

Present combination. *Wormaldia corvina* (McL.).

Dolophilus pullus McLachlan, 1878, p. 389.

Lectotype ♂. McL. type-label (mauve). Meyer-Dur, Helvet. Label in McL.'s writing, *Dolophilus pullus McL.* B.M. 1938–674. Printed label (blue), Dolophilus pullus McLach., det. McLachlan.

The abdomen has been mounted as a microscope preparation.

Present combination. *Wormaldia pulla* (McL.).

Philopotamus amphilectus McLachlan, 1884, p. 48.

Lectotype ♂. McL. type-label (pink). Cea, 4/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Philopotamus amphilectus McL.* B.M. 1938–674. Printed label (blue), Philopotamus amphilectus McLach., det. McLachlan.

Philopotamus ludificatus McLachlan, 1878, p. 382.

Kimmins, 1949, p. 35, (♂ holotype, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Philopotamus montanus (Donovan), var. ***cesareus*** McLachlan, 1884, p. 47.

Lectotype ♂. Jersey. B.M. 1938–674. Printed label (blue), Philopotamus montanus, var. cesareus McLach., det. McLachlan. Lectoallotype ♀. Same data.

Philopotamus variegatus (Scopoli), var. ***hispanicus*** McLachlan, 1878, p. 386.

Lectotype ♀. Spain, Sierra de Gredos. B.M. 1938–674. Printed label (blue), Philopotamus variegatus Scop., var. hispanicus McLach., det. McLachlan.

Philopotamus insularis McLachlan, 1878, p. 384.

Lectotype ♂. Guernsey. B.M. 1938–674. Printed label (blue), Philopotamus insularis McLach., det. McLachlan. Lectoallotype ♀. Same data.

It may be pointed out that mixed with McLachlan's type-series, were two male *Rhyacophila septentrionis* and one male *Plectrocnemia geniculata*.

Philopotamus perversus McLachlan, 1884, p. 46.

Lectotype ♂. McL. type-label (pink). Villa Real, 25/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Philopotamus perversus McL.* B.M. 1938–674. Printed label (blue), Philopotamus perversus McLach., det. McLachlan. Lectoallotype ♀. McL. type-label (pink). Ruivães, 29/6. Other data as in male.

Wormaldia copiosa (McLachlan). See ***Dolophilus***.

Wormaldia corvina (McLachlan). See ***Dolophilus***.

Wormaldia pulla (McLachlan). See ***Dolophilus***.

Wormaldia subnigra McLachlan, 1865, p. 142.

Lectotype ♂. N. Wales, P. C. Wormald. 35/64. B.M. 1938–674. Printed label (blue), Wormaldia subnigra McLach., det. McLachlan.

This specimen is the only one from any of the original localities mentioned by McLachlan. The abdomen has been removed, cleared and preserved in a small tube of glycerine, attached to the staging pin.

Family Polycentropodidae

Cyrnus cintranus McLachlan, 1884, p. 54.

Lectotype ♂. McL. type-label (pink). Cintra, 29/4. Eaton, Portugal, 1880. Label in McL.'s writing, *Cyrnus cintranus McL.* B.M. 1938–674. Printed label (blue), Cyrnus cintranus McLach., det. McLachlan. Lectoallotype ♀. Same data.

Cyrnus flavidus McLachlan, 1864, p. 29.

Kimmins, 1949, p. 36. (♂ type = lectotype ♂).

Cyrnus insolutus McLachlan, 1878, p. 406 ; 1898, p. 50.

Holotype is unique ♀.
Kimmins, 1949, p. 36 (♂ allotype = lectotype ♂).

Dipseudopsis collaris McLachlan, 1863, p. 496.

Lectotype ♂. Circular blue label, on one side " Hong Kong ", on other side, 61.49.

The second example mentioned by McLachlan (North China) is a female, and in the absence of any evidence that it is correctly associated with the lectotype, I do not propose to designate it as the allotype.

Dipseudopsis indica McLachlan, 1875*a*, p. 18.

Lectotype ♂. McL. type-label (pink). India. Label in McL.'s writing, *Dipseudopsis indicus McL.* B.M. 1938–674. Label in Ulmer's writing, *Dipseudopsis indica McL. 2 Stücke.* Lectoallotype ♀. Same data, but lacking Ulmer's label.

The lectotype male now lacks both left wings and most legs. The lectoallotype has lost metathorax and abdomen.

Dipseudopsis stellata McLachlan, 1875*a*, p. 16.

The McLachlan collection contained seven examples labelled Shanghai, 4 ♂, 2 ♀ and one damaged specimen. His description applies only to the male sex and only one male example bears one of his type-labels. This suggests that the females at least are not of the type-series. Comparison of the writing on the determination labels confirms this and I am of the opinion that McLachlan only had the one example before him when drawing up his description, which specimen automatically becomes the HOLOTYPE.

Plectrocnemia apennina McLachlan, 1884, p. 52.

LECTOTYPE ♂. McL. type-label (pink). Apennino Pistojese, Eaton, 1882. 27.vii.82. Label in McL.'s writing *Plectrocnemia appennina McL.* B.M. 1938–674. Printed label (blue), Plectrocnemia appennina McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

The lectotype male has had the abdomen removed, cleared and preserved in a small tube of glycerine. The spelling of the specific name in the original publication and on McLachlan's labels was *appennina*. A Latin dictionary gives the spelling of the locality with only one " p ", as is the case with the printed locality labels. I therefore consider the spelling *appennina* to be a *lapsus calami* and have emended it as above.

Plectrocnemia brevis McLachlan, 1871*a*, p. 145.

LECTOTYPE ♂. McL. type-label (pink). Sedrun, 27 July. Label in McL.'s writing, *brevis McL.* Printed label (blue), Plectrocnemia brevis McL. B.M. 1938–674.

Plectrocnemia conspersa Curtis, var. **breviuscula** McLachlan, 1884, p. 51.

LECTOTYPE ♂. McL. type-label (pink). Lago Silissi, 29.vii.1881. Label in McL.'s writing, *breviuscula*. B.M. 1938–674. Printed label (blue), Plectrocnemia conspersa Curt., var. breviuscula McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

The female type has the abdomen detached and gummed on card.

Plectrocnemia geniculata McLachlan, 1871*a*, p. 145.

LECTOTYPE ♂. McL. type-label (pink). Sedrun, 27 July. Label in McL.'s writing, *geniculata McL.* B.M. 1938–674. Printed label (blue), Plectrocnemia geniculata McLach., det. McLachlan.

Plectrocnemia laetabilis McLachlan, 1880, p. lxxiii.

LECTOTYPE ♂. McL. type-label (mauve). Pyrenees, 24/6. Eaton, 1878. Label in McL.'s writing, *Plectrocnemia laetabilis McL.* B.M. 1938–674. Printed label (blue) Plectrocnemia McLach., det. McLachlan.

Plectrocnemia scruposa McLachlan, 1880, p. lxxii.

LECTOTYPE ♂. McL. type-label (mauve). Pyrenees, 26/6. Eaton, 1878. Label in McL.'s writing, *Plectrocnemia scruposus McL.* B.M. 1938–674. Printed label (blue), Plectrocnemia scruposa McLach., det. McLachlan.

Polycentropus corniger McLachlan, 1884, p. 53.

LECTOTYPE ♂. McL. type-label (pink). Villa Real, 23/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Polycentropus corniger McL.* B.M. 1938–674. Printed label (blue), Polycentropus corniger McLach., det McLachlan. LECTOALLOTYPE ♀. Same data.

Polycentropus kingi McLachlan, 1881*a*, p. 254.

LECTOTYPE ♂. McL. type-label (mauve). Inverness-shire, Strathglass, vii–viii.1880, J. J. F. X. King. 146. 1/81. Label in McL.'s writing *Polycentropus kingi McL.* B.M. 1938–674. Printed label (blue), Polycentropus kingi McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Polycentropus puerilis McLachlan, 1868*a*, p. 204.

LECTOTYPE ♂. McL. type-label (pink). Christchurch, N.Z., Fereday. Label in McL.'s writing, *Polycentropus puerilis McL.* B.M. 1938–674. LECTOALLOTYPE ♀. Same data.

Present combination. *Polyplectropus puerilis* (McLachlan).

Polycentropus subnebulosus McLachlan, 1865, p. 146.

Kimmins, 1949, p. 36 (♂ type = LECTOTYPE ♂).

Synonym of *Holocentropus dubius* (Rambur).

Polycentropus telifer McLachlan, 1884, p. 54.

LECTOTYPE ♂. McL. type-label (pink). Cintra, 31/5. Eaton, Portugal, 1880. Label in McL.'s writing, *Polycentropus telifer McL.* B.M. 1938–674. Printed label (blue), Polycentropus telifer McLach., det. McLachlan.

Polyplectropus puerilis (McLachlan). See **Polycentropus**.

Family PSYCHOMYIDAE

Ecnomus deceptor McLachlan, 1884, p. 55 ; Mosely, 1948, p. 103.

LECTOTYPE ♂. McL. type-label (pink). Bouillon, 9/7. Label in McL.'s writing, *Ecnomus deceptor McL.* B.M. 1938–674. Printed label (blue), Ecnomus deceptor McLach., det. McLachlan.

The lectotype male has had its abdomen removed, cleared and mounted in canada balsam. It is from this specimen that Mosely's description and figures of the male genitalia were made.

Lype auripilis McLachlan, 1884, p. 58.

LECTOTYPE ♂. McL. type-label (pink). Monchique, 19/5. Eaton, Portugal, 1880. Label in McL.'s writing, *Lype auripilis McL.* B.M. 1938–674. Printed label (blue), Lype auripilis McLach., det. McLachlan.

Psychomyia ctenophora McLachlan, 1884, p. 59.

LECTOTYPE ♂. McL. type-label (pink). Ponte de Morcellos, 12/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Psychomyia ctenophora McL.* B.M. 1938–674. Printed label (blue), Psychomyia ctenophora McLach., det. McLachlan.

Psychomyia (Homoeocerus) derelicta McLachlan, 1863*a*, p. clii.

Kimmins, 1949, p. 37 (♀ type = LECTOTYPE ♀).

Tinodes assimilis McLachlan, 1865, p. 133.

Kimmins, 1949, p. 36 (♂ type = LECTOTYPE ♂).

Tinodes consueta McLachlan, 1871, p. 138.

Kimmins & Denning, 1951, p. 116 (♂ type = LECTOTYPE ♂).

Tinodes foedella McLachlan, 1884, p. 57.

LECTOTYPE ♂. McL. type-label (pink). Cea, 11/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Tinodes foedella McL.* B.M. 1938–674. Printed label (blue), Tinodes foedella McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Tinodes merula McLachlan, 1882, p. 160.

LECTOTYPE ♀. McL. type-label (mauve). Madeira, 23/11. Label in McL.'s writing, *Tinodes merula McL.* B.M. 1938–674. Printed label (blue), Tinodes merula McLach., det. McLachlan.

Tinodes pallidula McLachlan, 1878, p. 419.

LECTOTYPE ♂. McL. type-label (mauve). Saxony. Label in McL.'s writing, *Tinodes pallidula McL.* B.M. 1938–674. Printed label (blue), Tinodes pallidula McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Tinodes pusilla MacLachlan, 1865, p. 132.

The type of this species has not been traced in McLachlan's collection. The specific name is available to replace *Tinodes aureole* McLachlan *nec* Zetterstedt.

Tinodes rostocki McLachlan, 1878, p. 420.

LECTOTYPE ♂. McL. type-label (mauve). Saxony. Label in McL.'s writing, *Tinodes rostocki McL.* B.M. 1938–674. Printed label (blue), Tinodes rostocki McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Tinodes zelleri McLachlan, 1878, p. 420.

LECTOTYPE ♂. Carinthia, Raibl Valley, 12 June 1867, Zeller. B.M. 1938–674. LECTOALLOTYPE ♀. McL. type-label (mauve). Zeller, Carinthia, 12/6/67. Label in McL.'s writing, *Tinodes zelleri McL.* B.M. 1938–674. Printed label (blue), Tinodes zelleri McLach., det. McLachlan.

The lectotype male has been mounted as a microscope preparation.

Family HYDROPSYCHIDAE.

Amphipsyche proluta McLachlan, 1872, p. 70.

LECTOTYPE ♂. McL. type-label (pink). Amur Land. Label in McL.'s writing, *Amphipsyche proluta McL.* B.M. 1938–674. Printed label (blue), Amphipsyche proluta McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Cheumatopsyche albofasciata (McLachlan). See ***Hydropsyche.***

Chloropsyche evanescens McLachlan, 1880. p. lxix.

LECTOTYPE ♂. Amur Land. Label in McL.'s writing, *Chloropsyche evanescens McL.* B.M. 1938–674. Printed label (blue), Chloropsyche evanescens McLach., det. McLachlan.

The second male mentioned by McLachlan is no longer in his collection.

Diplectrona felix McLachlan, 1878, p. 376.

Kimmins, 1949, p. 35 (♂ type, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Hydropsyche albofasciata McLachlan, 1872, p. 68.

LECTOTYPE ♂. McL. type-label (pink). Amur Land. Label in McL.'s writing, *albofasciata McL.* B.M. 1938–674. Printed label (blue), Hydropsyche albofasciata McLach., det. McLachlan.

Present combination. *Cheumatopsyche albofasciata* (McLachlan).

Hydropsyche bulbifera McLachlan, 1878, p. 362.

Kimmins, 1949, p. 35 (♀ allotype = LECTOALLOTYPE ♀).

Hydropsyche colonica McLachlan, 1871, p. 131.

Mosely & Kimmins, 1953, p. 320 (♂ type = LECTOTYPE ♂).

LECTOALLOTYPE ♀. McL. type-label (pink). Christchurch, N.Z., Fereday. Label in McL.'s writing, *Hydropsyche colonica McL.* B.M. 1938–674.

The lectoallotype female is the specimen referred to by Mosely (1953) as a paratype.

Hydropsyche consanguinea McLachlan, 1884, p. 42.

LECTOTYPE ♂. McL. type-label (pink). Persien. Label in McL.'s writing, *Hydropsyche consanguinea McL.* B.M. 1938–674. Printed label (blue), Hydropsyche consanguinea McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

The lectotype male has had the abdomen removed, cleared and preserved in a small tube of glycerine.

Hydropsyche fimbriata McLachlan, 1862, p. 309.

Mosely & Kimmins, 1953, p. 318 (♂ type = LECTOTYPE ♂).
LECTOALLOTYPE ♀. N. Zeal. 54.4.

Hydropsyche ornatula McLachlan, 1878, p. 363.

Kimmins, 1949, p. 35 (♂ type, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Hydropsyche stimulans McLachlan, 1878, p. 370.

LECTOTYPE ♂. McL. type-label (mauve). Turkestan. Label in McL.'s writing, *Hydropsyche stimulans McL.* B.M. 1938–674. Printed label (blue), Hydropsyche stimulans McLach., det. McLachlan.

Abdomen of lectotype in small tube of glycerine.

Macronema lautum McLachlan, 1862, p. 308.

LECTOTYPE ♀. Hong Kong. 61.49. Label in McL.'s writing, *M. lauta McL.* The lectotype has the right wings expanded and right antenna damaged.

Macronema polygrammatum McLachlan, 1871, p. 129.

Kimmins & Denning, 1951, p. 121 (♂ type = LECTOTYPE ♂).
Synonym of *Macronema transversum* (Walker).

Macronema radiatum McLachlan, 1872. p. 66.

LECTOTYPE ♂. McL. type-label (pink). Sibir. Or., Maack. Label in McL.'s writing, *Macronema radiatum McL.* B.M. 1938–674. Printed label (blue), Macronema radiatum McLach., det. McLachlan.

Smicridea fasciatella McLachlan, 1871, p. 136.

Kimmins & Denning, 1951, p. 120 (♂ holotype, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Smicridea murina McLachlan, 1871, p. 137.

LECTOTYPE ♂. McL. type-label (pink). Chili. Label in McL.'s writing, *Smicridea murina McL.* B.M. 1938–674. LECTOALLOTYPE ♀. Same data.

The abdomen of the male has been mounted in canada balsam as a microscope preparation.

Smicridea saucia McLachlan, 1871, p. 137.

LECTOTYPE ♂. McL. type-label (pink). Peru. Label in McL.'s writing, *Smicridea saucia McL.* B.M. 1938–674.

The abdomen of the lectotype has been cleared in caustic potash solution and placed in glycerine in a small tube attached to the pin.

Family HYDROPTILIDAE

Agraylea pallicornis Eaton, 1873, p. 148.

LECTOTYPE ♂. McL. type-label (pink). Turin, Ghiliani. Label in McL.'s writing, *pallicornis Etn.* B.M. 1938–674. Printed label (blue), Agraylea pallicornis Eaton, det. McLachlan.

Present combination. *Allotrichia pallicornis* (Eaton).

Allotrichia pallicornis (Eaton). See ***Agraylea.***

Hydroptila angustella McLachlan, 1865, p. 95.

LECTOTYPE ♀. Middlesex, R. Thames, Nr. Hampton, 12.vii.1865, R. McLachlan. 26/65. B.M. 1938–674. Printed label (blue), Orthotrichia angustella McLach., det. McLachlan.

Present combination. *Orthotrichia angustella* (McLachlan).

Of the three original specimens mentioned by McLachlan, only the example mentioned above can now be traced in his collection. This specimen now lacks the metathorax and abdomen.

Hydroptila campanulata Morton, 1896, p. 103.

LECTOTYPE ♂. Algeria, Eaton. Biskra, 8.ii.94. Label in Morton's writing, *campanulata.* B.M. 1938–674.

Lectotype male mounted as a microscope preparation in canada balsam by M.E. Mosely.

Hydroptila femoralis (Eaton). See ***Phrixocoma.***

Hydroptila forcipata (Eaton). See ***Phrixocoma.***

Hydroptila fortunata Morton, 1893, p. 76.

LECTOTYPE ♂. Grand Canary, 11/12/80. Label in Morton's writing, *Hydroptila fortunata.* B.M. 1938–674.

Specimen mounted in canada balsam as a microscope preparation by M. E. Mosely.

Hydroptila longispina McLachlan, 1884, p. 71.

LECTOTYPE ♂. McL. type-label (pink). Near Ambleside, viii.1881, J. J. F. X. King. 160. Label in McL.'s writing, *longispina McL.* B.M. 1938–674. Printed label (blue), Hydroptila femoralis Eaton, det. McLachlan. LECTOALLOTYPE ♀. Same data.

Synonym of *Hydroptila tineoides* Dalman.

Hydroptila occulta (Eaton). See ***Phrixocoma.***

Hydroptila serrata Morton, 1898*a*, p. 108.

LECTOTYPE ♂. McL. type-label (pink). Bône, 7.iv.96. Algeria, Eaton. Label in Morton's writing, *Hydroptila serrata*. B.M. 1938–674. Printed label (blue), Hydroptila serrata Mort., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Hydroptila stellifera Morton, 1893, p. 75.

LECTOTYPE ♂. Apennino Pistojese, Eaton, 1882. 27.vii.82. Label in Morton's writing, *Hydroptila stellifera*. B.M. 1938–674. LECTOALLOTYPE ♀. McL. type-label (pink). Apennino Pistojese, Eaton, 1882. 27.vii.82. Label in Morton's writing, *Hydroptila stellifera*. B.M. 1938–674. Printed label (blue), Hydroptila stellifera Mort., det. McLachlan.

I have selected as the lectotype male a specimen mounted in canada balsam as a microscope preparation by M. E. Mosely.

Hydroptila uncinata Morton, 1893, p. 77.

LECTOTYPE ♂. Apennino Pistojese, Eaton, 1882. 26.vii.82. Label in Morton's writing, *Hydroptila uncinata*. B.M. 1938–674. Printed label (blue), Hydroptila uncinata Mort., det. McLachlan.

The lectotype consists of two preparations, made by Morton, mounted between cover-glasses. These were originally attached to a pin, but have now been fastened by gummed strips to a microscope slide. The other two specimens mentioned have not been traced in the McLachlan collection.

Ithytrichia lamellaris Eaton, 1873, p. 140.

LECTOTYPE ♂. McL. type-label (pink). Derbyshire, Sandy Brook, near Hanging Bridge, 14.vi.1871, A. E. Eaton. Label in McL.'s writing, *lamellaris Etn*. B.M. 1938–674. Printed label (blue), Ithytrichia lamellaris Eaton, det. McLachlan.

The type has been reduced by the action of pests to a thorax and one pair of wings. The paratype has been similarly affected.

Orthotrichia angustella (McLachlan). See ***Hydroptila***.

Oxyethira spinosella McLachlan, 1884, p. 72.

LECTOTYPE ♂. McL. type-label (pink). Madeira, 25/11/80. Label in McL.'s writing, *Oxyethira spinosella McL*. B.M. 1938–674. Printed label (blue), Oxyethira spinosella McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Oxyethira unidentata McLachlan, 1884, p. 73.

LECTOTYPE ♂. McL. type-label (pink). Silves, 17/5. Eaton, Portugal, 1880. Label in McL.'s writing, *Oxyethira unidentata McL*. B.M. 1938–674. Printed label (blue), Oxyethira unidentata McLach., det. McLachlan.

Phrixocoma femoralis Eaton, 1873, p. 137.

LECTOTYPE ♂. McL. type-label (pink). Derbyshire, Mappleton, 9–10.vi.1871, A. E. Eaton. Label in McL.'s writing, *femoralis Etn.* B.M. 1938–674. Printed label (blue), Hydroptila femoralis Eaton, det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Hydroptila femoralis* (Eaton), synonym of *Hydroptila tineoides* Dalman.

Phrixocoma forcipata Eaton, 1873, p. 135.

LECTOTYPE ♂. McL. type-label (pink). Derbyshire, Mappleton, 9–10.vi.1871, A. E. Eaton. Label in McL.'s writing, *forcipata Etn.* B.M. 1938–674. Printed label (blue), Hydroptila forcipata Eaton, det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Hydroptila forcipata* (Eaton).

Phrixocoma occulta Eaton, 1873, p. 135.

LECTOTYPE ♂. McL. type-label (pink). Label in McL.'s writing, *occulta Etn.* B.M. 1938–674. Printed label (blue), Hydroptila occulta Eaton, det. McLachlan.

The type and three paratypes were found, without any locality labels, in McLachlan's British Trichoptera collection.

Present combination. *Hydroptila occulta* (Eaton).

Family PHRYGANEIDAE

Neuronia stålii McLachlan, 1868, p. 289.

LECTOTYPE ♂. McL. type-label (pink). Sweden. Label in McL.'s writing, *stålii McL.* (*Type*). B.M. 1938–674. Printed label (blue), Oligostomis stalii McLach.

Present combination. *Oligostomis stålii* (McLachlan).

Oligostomis stålii (McLachlan). See **Neuronia.**

Phryganea obsoleta McLachlan, 1865, p. 16.

Kimmins, 1949, p. 33 (♂ type = LECTOTYPE ♂).

Phyrganea japonica McLachlan, 1866*a*, p. 248.

LECTOTYPE ♂. Hakodadi. Label in McL.'s writing, *Phryganea japonica McL.* B.M. 1938–674. LECTOALLOTYPE ♀. Japan. Other data as in male.

None of the specimens bears either a McL. type-label or has been marked as " type " by him. The lectotype male has been chosen from three males to which Mosely had attached co-type labels, two from McLachlan's collection and one from the British Museum series. I did not select the latter (although I have no doubt that it is one of the type series) because it does not bear a determination label by

McLachlan, only a hand-written label (not McLachlan, I believe) " Gen. Holostomis, new sp." The female allotype I have chosen from two in McLachlan's collection, whose determination labels are in writing which I think belongs to about the right period. I have rejected the specimens collected by Pryer, since at the time of publication of *japonica* he would only have been about sixteen years old.

Family LIMNEPHILIDAE

Allogamus hilaris (McLachlan). See ***Halesus.***

Allogamus ligonifer (McLachlan). See ***Halesus.***

Allogamus mendax (McLachlan). See ***Halesus.***

Anabolia dualis (McLachlan). See ***Arctoecia.***

Anabolia nervosa (Curtis), var. ***putoni*** McLachlan, 1884, p. 7.

LECTOTYPE ♂. McL. type-label (pink). Vosges, 1883, Label in McL.'s writing, *var. putoni McL.* B.M. 1938–674. Printed label (blue), Anabolia nervosa (Leach) Curtis, var. putoni McLach., det. McLachlan. LECTOALLOTYPE ♀. Data as male, but lacking McL. type-label and McL. MSS. label.

Anabolia soror McLachlan, 1875, p. 104.

LECTOTYPE ♂. 29/9/60, Zeller. B.M. 1938–674. Printed label (blue), Anabolia soror McLach., det. McLachlan. LECTOALLOTYPE ♀. Zeller. B. M.1938–674. Printed label (blue), Anabolia soror McLach., det. McLachlan.

Anabolia sororcula McLachlan, 1876, p. viii (♂) ; 1880, p. xxiv (♀).

LECTOTYPE ♂. Minsk. Wankowicz. B.M. 1938–674. Printed label (blue), Anabolia sororcula McLach., det McLachlan. LECTOALLOTYPE ♀. Finland, Sahlberg. B.M. 1938–674. Printed label (blue), Anabolia sororcula McLach., det. McLachlan.

Synonym of *Anabolia soror* McLachlan.

Anisogamus difformis (McLachlan). See ***Stenophylax.***

Anisogamus noricanus McLachlan, 1875, p. 110.

LECTOTYPE ♂. McL. type-label (mauve). Alp. noric., Nassfeld, Palmén. Label in McL.'s writing, *Anisogamus noricanus McL.* B.M. 1938–674. Printed label (blue), Anisogamus noricanus McLach., det. McLachlan.

Annitella (Praeannitella) obscurata (McLachlan). See ***Chaetopteryx.***

Apatania eatoniana McLachlan, 1880, p. xlv.

LECTOTYPE ♂. McL. type-label (pink). Mt. Mezenc, 2/8. Eaton, 1878. Label in McL.'s writing, *Apatania eatoniana McL.* B.M. 1938–674. Printed label (blue) Apatania eatoniana McLach., det. McLachlan. LECTOALLOTYPE ♀. McL. type-label (mauve). Haute Loire, 1/8. Other data as in male.

Apatania frigida McLachlan, 1867, p. 57.

Kimmins & Denning, 1951, p. 121 (♂ holotype, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Synonym of *Apatania stigmatella* (Zetterstedt).

Apatania majuscula McLachlan, 1872, p. 66.

LECTOTYPE ♂. McL. type-label (pink). Irkutsk, 20.v.66. Sibir. orient., Maack. Label in McL.'s writing, *Apatania majuscula McL.* B.M. 1938–674. Printed label (blue), Apatania majuscula McLach., det. McLachlan.

Apatania meridiana McLachlan, 1880, p. xliv.

LECTOTYPE ♂. McL. type-label (mauve). Pyrenees, 10/6. Eaton, 1878. Label in McL.'s writing *Apatania meridiana McL.* B.M. 1938–674. Printed label (blue), Apatania meridiana McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Apatania muliebris McLachlan 1866, p. 113 ; 1876, p. 215.

LECTOTYPE ♀. Sussex, Arundel, 22.viii.1865, R. McLachlan. 32/65. B.M. 1938–674. Printed label (blue), Apatania muliebris McLach., det. McLachlan.

The abdomen of the type has been made into a microscope preparation and attached to the pin of the specimen. In 1865 (footnote, p. 75) McLachlan gave a brief diagnosis of the species, without giving it a name ; in 1866 he gave it the provisional name *muliebris*, and in 1876 he gave the first full description. I am of the opinion that the name should date from 1866.

Apatania wallengreni McLachlan, 1871*b*, p. 281.

Kimmins, 1949, p. 34 (♂ type, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Arctoecia dualis McLachlan, 1875, p. 108.

LECTOTYPE ♀. McL. type-label (pink). Sweden. Label in McL.'s writing, *Arctoecia dualis McL.* B.M. 1938–674. Printed label (blue), Arctoecia concentrica Zett., det. McLachlan.

Present combination. *Anabolia dualis* (McLachlan), synonym of *Anabolia concentrica* (Zetterstedt).

Asynarchus fusorius (McLachlan). See ***Stenophylax***.

Catadice estrellensis McLachlan, 1884, p. 13.

LECTOTYPE ♂. McL. type-label (mauve). Sabugueira, 5/6. Eaton, Portugal, 1880. Label in McL.'s writing, *Catadice estrellensis McL.* B.M. 1938–674. Printed label (blue), Catadice estrellensis McLach., det. McLachlan. LECTOALLOTYPE ♀. McL. type-label (pink), otherwise as in male.

Present combination. *Drusus estrellensis* (McLachlan).

Chaetopteryx major McLachlan, 1876, p. 198.

Kimmins, 1949, p. 34 (♂ type = LECTOTYPE ♂).

LECTOALLOTYPE ♀. Roghfr [? Rogenhofer). Chaetopteryx villosa Fb. Austr. B.M. 1938–674. Printed label (blue), Chaetopteryx major McLach., det. McLachlan.

Chaetopteryx obscurata McLachlan, 1884, p. 16 (♀).

LECTOALLOTYPE ♀. Vosges, 1883. B.M. 1938–674. Printed label (blue), Chaetopteryx obscurata McLach., det. McLachlan.

Present combination. *Annitella* (*Praeannitella*) *obscurata* (McLachlan).

Consorophylax consors (McLachlan). See ***Stenophylax.***

Consorophylax montivagus (McLachlan). See ***Stenophylax.***

Cryptothrix nebulicola McLachlan, 1867, p. 56.

LECTOALLOTYPE ♀. No 24 in collection sent to Mr. Curtis by M. Pictet, and subsequently purchased by the British Museum (Nat. Hist.). 24. Brévent. Purchased from Mr. Curtis. B.M. 1927–468.

Drusus estrellensis (McLachlan). See ***Catadice.***

Drusus improvisus (McLachlan). See ***Monocentra.***

Drusus melanchaetes McLachlan, 1876, p. 177.

LECTOTYPE ♂. McL. type-label (mauve). Gotthrd, 19.vii. Label in McL.'s writing, *Drusus melanchaetes McL.* B.M. 1938–674. Printed label (blue), Drusus melanchaetes McLach., det. McLachlan. LECTOALLOTYPE ♀. Furka. B.M. 1938–674. Printed label (blue), Drusus melanchaetes McLach., det. McLachlan.

Drusus monticola McLachlan, 1876, p. 174.

LECTOTYPE ♂. McL. type-label (mauve). Seefeld, Eaton. Label in McL.'s writing, *Drusus monticola McL.* B.M. 1938–674. Printed label (blue), Drusus monticola McLach., det. McLachlan.

Ecclisopteryx madida (McLachlan). See ***Halesus.***

Glyphotaelius mutatus McLachlan, 1872, p. 60.

LECTOTYPE ♂. McL. type-label (pink). Sibir. Or., Maack. Label in McL.'s writing, *Glyphotaelius mutatus McL.* B.M. 1938–674. Printed label (blue), Glyphotaelius mutatus McLach. LECTOALLOTYPE ♀. Same data.

Present combination. *Nemotaulius* (*Macrotaulius*) *mutatus* (McLachlan).

Grammotaulius brevilinea McLachlan, 1871, p. 107.

LECTOTYPE ♀. McL. type-label (pink). Japan. Label in McL.'s writing, *Grammotaulius brevilinea McL.* B.M. 1938–674.

I am unable to recognize the second example referred to by McLachlan. All the other examples are collected by Pryer or Lewis, whose names would certainly have been mentioned by him.

Present combination. *Nemotaulius brevilinea* (McLachlan).

Grammotaulius sibiricus McLachlan, 1874, p. 40 ; 1876, p. iv ; 1880, p. xvi.

LECTOTYPE ♂. Sibir. orient., Maack. Label in McL.'s writing, *Grammotaulius sibiricus McL.* B.M. 1938–674. LECTOALLOTYPE ♀. Car. lad., Appelberg. Label in McL.'s writing, *Grammotaulius sibiricus* ♀. B.M. 1938–674. Printed label (blue), Grammotaulius sibiricus McLach.

The abdomens of both male and female have been mounted as microscope preparations.

Grammotaulius signatipennis McLachlan, 1876, p. iv (♂) ; 1880, p. xvii (♀).

LECTOALLOTYPE ♀. McL. type-label (pink). Sibir. orient. Maack. Labels in McL.'s writing, *Grammotaulius sibiricus McL.*, *Grammotaulius signatipennis* ♀. B.M. 1938–674.

Halesus amplus McLachlan, 1894, p. 421.

LECTOTYPE ♂. McL. type-label (pink). Ta-chien-lu. Label in McL.'s writing, *Halesus amplus McL.* B.M. 1938–674. Pseudostenophylax amplus McL., det. M. E. Mosely. LECTOALLOTYPE ♀. McL. type-label (pink). Thibet, Tatsienloù, Mgr. F. Biet. Label in McL.'s writing, *Halesus amplus McL.* B.M. 1938–674.

The lectotype male has had the abdomen removed, cleared and mounted as a microscope preparation.

Present combination. *Pseudostenophylax amplus* (McLachlan).

Halesus hilaris McLachlan, 1876, p. 154.

LECTOTYPE ♂. McL. type-label (mauve). Airolo. Label in McL.'s writing, *Halesus hilaris McL.* B.M. 1938–674. Printed label (blue), Halesus hilaris McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Allogamus hilaris* (McLachlan).

Halesus ligonifer McLachlan, 1876, p. 155 ; 1884, p. 13.

LECTOALLOTYPE ♂. Vosges, 1883. B.M. 1938–674. Printed label (blue), Halesus ligonifer McLach., det. McLachlan.

Present combination. *Allogamus ligonifer* (McLachlan).

Halesus madidus McLachlan, 1867, p. 53.

LECTOTYPE ♂. McL. type-label (mauve). Stelzing, Jul. 61. Zeller. 61. Labels in McL.'s writing, *madidus McL.* (*Type*), *Ecclisopteryx madida McL.* B.M. 1938–674.

Printed label (blue), Ecclisopteryx madida McLach., det. McLachlan. LECTOALLOTYPE ♀. Data as in male, apart from *madidus McL.* (*Type*).

Present combination. *Ecclisopteryx madida* (McLachlan).

Halesus melampus McLachlan, 1876, p. 158.

LECTOTYPE ♂. McL. type-label (mauve). Airolo. Label in McL.'s writing, *Halesus melampus McL.* B.M. 1938–674. Printed label (blue), Halesus melampus McLach., det. McLachlan.

Present combination. *Melampophylax melampus* (McLachlan).

Halesus mendax McLachlan, 1876, p. 156.

LECTOTYPE ♂. McL. type-label (mauve). Switzerland. Label in McL.'s writing, *Halesus mendax McL.* B.M. 1938–674. Printed label (blue), Halesus mendax McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Allogamus mendax* (McLachlan).

Hydatophylax infumatus (McLachlan). See ***Stenophylax***.

Hydatophylax nigrovittatus (McLachlan). See ***Platyphylax***.

Limnophilus centralis Curtis, var. ***italicus*** McLachlan, 1884, p. 6.

LECTOTYPE ♂. McL. type-label (pink). Apennino Pistojese, Eaton, 2.viii.1882. Label in McL.'s writing, *L. centralis, var. italicus McL.* B.M. 1938–674. Printed label (blue), Limnophilus centralis Curt., var. italicus McL., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Limnephilus centralis* Curtis, var. *italicus* McLachlan.

Limnophilus dispar McLachlan, 1873, p. 97.

LECTOTYPE ♂. Minsk, Wankowicz. Label in McL.'s writing, *L. dispar.* B.M. 1938–674. Printed label (blue), Limnophilus dispar McLach., det. McLachlan.

LECTOALLOTYPE ♀. 13/5/63, Zeller. Other labels as in male.

The male has one pair of wings removed and mounted on card.

Present combination. *Limnephilus dispar* McLachlan.

Limnophilus extricatus McLachlan, 1865, p. 49.

Kimmins, 1949, p. 34 (♂ type, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Present combination. *Limnephilus extricatus* McLachlan.

Limnophilus miser McLachlan, 1875, p. 89.

Kimmins & Denning, 1951, p. 124 (type ♂, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Present combination. *Limnephilus miser* McLachlan.

Limnophilus pantodapus McLachlan, 1875, p. 70.

LECTOTYPE ♂. McL. type-label (pink). Minute label, Lp. in. Label in McL.'s writing, *L. pantodapus McL.* B.M. 1938–674. Printed label (blue), Limnophilus pantodapus (Wlgr.) McL., det. McLachlan.

Present comibnation. *Limnephilus pantodapus* McLachlan.

Limnophilus picturatus McLachlan, 1875, p. 78.

LECTOTYPE ♀. McL. type-label (pink). Sweden. Label in McL.'s writing, *L. picturatus McL.* B.M. 1938–674. Printed label (blue), Limnophilus picturatus McLach., det. McLachlan.

Present combination. *Limnephilus picturatus* McLachlan.

Limnophilus politus McLachlan, 1865, p. 39.

Kimmins, 1949, p. 33 (♂ type, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Present combination. *Limnephilus politus* McLachlan.

Limnephilus xanthodes McLachlan, 1875, p. 60.

LECTOTYPE ♂. Norfolk, Norwich and Ranworth Fen, 1871, C. G. Barrett. 6/71. B.M. 1938–674. Printed label (blue), Limnophilus xanthodes McLachlan. LECTOALLOTYPE ♀. Same data.

Melampophylax melampus (McLachlan). See ***Halesus.***

Mesophylax aspersus Rambur, var ***canariensis*** McLachlan, 1882, p. 157.

LECTOTYPE ♂. McL. type-label (mauve). Grand Canary, 11/12. Canaries, Eaton, 1880. Label in McL.'s writing, *var. canariensis McLach.* B.M. 1938–674. Printed label (blue), Mesophylax aspersus Ramb., var. canariensis McLach., det. McLachlan.

Mesophylax impunctatus McLachlan, 1884, p. 10.

LECTOTYPE ♂. McL. type-label (pink). Zürich, 15.v. Label in McL.'s writing, *Mesophylax impunctatus McL.* B.M. 1938–674. Printed label (blue), Mesophylax impunctatus McLach., det. McLachlan.

Micropterna fissa (McLachlan). See ***Stenophylax.***

Micropterna nycterobia McLachlan, 1875, p. 139.

Kimmins, 1949, p. 34 (♀ type, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Present combination. *Stenophylax nycterobia* (McLachlan).

Micropterna sequax McLachlan, 1875, p. 141.

Kimmins, 1949, p. 34 (♂ type = LECTOTYPE ♂).

Present combination. *Stenophylax sequax* (McLachlan).

Monocentra improvisa McLachlan, 1884, p. 15.

LECTOTYPE ♂. McL. type-label (pink). Apennino Pistojese, 1.viii.1882, Eaton. Label in McL.'s writing, *Monocentra improvisa McL.* B.M. 1938–674. Printed label (blue), Monocentra improvisa McLach., det. McLachlan. LECTOALLOTYPE ♀. Date 2.viii.1882. otherwise as in male.

Present combination. *Drusus improvisus* (McLachlan).

Nemotaulius brevilinea (McLachlan). See ***Grammotaulius.***

Nemotaulius (Macrotaulius) mutatus (McLachlan). See ***Glyphotaelius.***

Platyphylax nigrovittatus McLachlan, 1872, p. 64.

LECTOTYPE ♂. McL. type-label (pink). Sibir. orient., Maack. Label in McL.'s writing, *Platyphylax nigrovittatus McL.* B.M. 1938–674. Printed label (blue), Platyphylax nigro-vittatus McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Hydatophylax nigrovittatus* (McLachlan).

Pseudopsilopteryx zimmeri (McLachlan). See ***Psilopteryx.***

Pseudostenophylax amplus (McLachlan). See ***Halesus.***

Pseudostenophylax amurensis (McLachlan). See ***Stenophylax.***

Psilopteryx zimmeri McLachlan, 1876, p. 189.

LECTOTYPE ♂. McL. type-label (mauve). Airolo, 9.x. Label in McL.'s writing, *Psilopteryx zimmeri McL.* B.M. 1938–674. Printed label (blue), Psilopteryx zimmeri McLach., det. McLachlan.

Present combination. *Pseudopsilopteryx zimmeri* (McLachlan).

Pycnopsyche limbata (McLachlan). See ***Stenophylax.***

Rhadicoleptus spinifer (McLachlan). See ***Stenophylax.***

Rhadicoleptus ucenorum (McLachlan). See ***Stenophylax.***

Stenophylax amurensis McLachlan, 1880, p. lxxxii.

LECTOTYPE ♀. McL. type-label (mauve). I. Askold, Amur. Label in McL.'s writing, *Stenophylax amurensis McL.* B.M. 1938–674. Printed label (blue), Stenophylax amurensis McLach., det. McLachlan.

According to McLachlan, there was also a female in the De Sélys collection. Ulmer (1907, *Coll. Zool. Sélys*, fasc. **6** (1), p. 24) makes no mention of this specimen in his account of the main De Sélys collection of Trichoptera and it was presumably missing at that time. The example from the McLachlan collection has therefore been designated as lectotype.

Present combination. *Pseudostenophylax amurensis* (McLachlan).

Stenophylax consors McLachlan, 1880, p. xxxiii.

LECTOTYPE ♂. McL. type-label (mauve). Savoy, 17/9/79. Label in McL.'s writing, *Stenophylax consors McL.* B.M. 1938–674. Printed label (blue), Stenophylax consors McLach., det. McLachlan.

Present combination. *Consorophylax consors* (McLachlan).

Stenophylax difformis McLachlan, 1867, p. 51.

Kimmins, 1949, p. 34 (♂ type, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Present combination. *Anisogamus difformis* (McLachlan).

Stenophylax fissus McLachlan 1875, p. 133.

LECTOTYPE ♂. McL. type-label (mauve). Montpellier. Label in McL.'s writing, *Stenophylax fissus McL.* B.M. 1938–674. Printed label (blue), Micropterna fissa McLach., det. McLachlan. LECTOALLOTYPE ♀. Tangier, Dec. 1873. Other data as for male.

Present combination. *Stenophylax fissus* McLachlan.

Stenophylax fusorius McLachlan, 1875, p. 116.

LECTOTYPE ♂. McL. type-label (mauve). Nr. alp. Label in McL.'s writing, *Stenophylax fusorius McL.* B.M. 1938–674. Printed label (blue), Stenophylax fusorius (Wllgr.) McLach., det. McLachlan.

Present combination. *Asynarchus fusorius* (McLachlan), synonym of *Asynarchus lapponicus* (Zetterstedt).

Stenophylax infumatus McLachlan, 1865, p. 63 (♂) ; 1875, p. 124 (♀).

LECTOTYPE ♂. McL. type-label (pink). Perthshire: Loch Rannoch dist., 2–12.vi.1865, R. McLachlan. 17/65. Label in McL.'s writing, *S. infumatus McL.* B.M. 1938–674. Printed label (blue), Stenophylax infumatus McLach., det. McLachlan. LECTOALLOTYPE ♀. Surrey, Haslemere, 1868, C. G. Barrett. 31/68. Other data as in male.

The lectoallotype female has been selected as it is the first female mentioned by McLachlan in his Monographic Revision.

Present combination. *Hydatophylax infumatus* (McLachlan).

Stenophylax limbatus McLachlan, 1871, p. 108.

Kimmins & Denning, 1951, p. 126 (♂ type = LECTOTYPE ♂).

Present combination. *Pycnopsyche limbata* (McLachlan).

Stenophylax montivagus McLachlan, 1867, p. 50.

LECTOTYPE ♂. Stelzing, Jul. 61. Zeller. 5. Label in McL.'s writing, *Stenophylax montivagus McL.* (*Type*). B.M. 1938–674. Printed label (blue), Stenophylax montivagus McLach., det. McLachlan.

The abdomen of the lectotype has been cleared in caustic potash and mounted as a microscope preparation in canada balsam.

Present combination. *Consorophylax montivagus* (McLachlan).

Stenophylax mucronatus McLachlan, 1884, p. 9 (♀).

LECTOALLOTYPE ♀. Zürich. Label in McL.'s writing, *mucronatus McL.* B.M. 1938–674. Printed label (blue), Stenophylax mucronatus McLach., det. McLachlan.

Stenophylax nycterobia (McLachlan). See ***Micropterna***.

Stenophylax sequax (McLachlan). See ***Micropterna***.

Stenophylax speluncarum McLachlan, 1875, p. 136.

LECTOTYPE ♂. McL. type-label (mauve). Laibach. Palmén. 54. Label in McL.'s writing, *Stenophylax speluncarum McL.* B.M. 1938–674. Printed label (blue), Stenophylax speluncarum McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Stenophylax spinifer McLachlan, 1875, p. 120.

LECTOTYPE ♂. McL. type-label (mauve). Pyrenees, Marshall. Label in McL.'s writing, *Stenophylax spinifer McL.* B.M. 1938–674. Printed label (blue), Stenophylax spinifer McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Rhadicoleptus spinifer* (McLachlan).

Stenophylax ucenorum McLachlan, 1876, p. ix.

LECTOTYPE ♂. McL. type-label (mauve). Col du Lautaret. Label in McL.'s writing, *Stenophylax ucenorum McL.* B.M. 1938–674. Printed label (blue), Stenophylax ucenorum McLach., det McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Rhadicoleptus ucenorum* (McLachlan).

Family MOLANNIDAE

Mollanodes zelleri McLachlan, 1866*a*, p. 179.

LECTOTYPE ♂. McL. type-label (pink). 28/7/63. Label in McL.'s writing, *zelleri McL.* B.M. 1938–674. Printed label (blue), Molannodes zelleri McLach., det. McLachlan.

Molannodes steinii McLachlan, 1872*a*, p. 118.

LECTOTYPE ♂. McL. type-label (pink). Silesia, Stein. Label in McL.'s writing, *steinii McL.* B.M. 1938–674. Printed label (blue), Molannodes steini McLach., det. McLachlan.

McLachlan lists two examples from Silesia in his collection, sent to him by Dr. Stein, and a male taken in Finland by Fedtschenko. Only one Silesian specimen can now be traced amongst McLachlan's material and this has been designated the lectotype. It may be pointed out that although the locality label reads " Silesia, Stein ", the original description states that the specimens were collected by de Chanoin (or von Chauvin).

Family CALAMOCERATIDAE

Anisocentropus cretosus McLachlan, 1875*a*, p. 11.

LECTOALLOTYPE ♀. McL. type-label (pink). Bouru, Wallace, Label in McL.'s writing, *Anisocentropus cretosus McL.* B.M. 1938–674.

Anisocentropus dilucidus McLachlan, 1863, p. 494.

LECTOTYPE ♂. Circular label " N ". Rectangular label, N. Gui., Wallace. Saunders, 68.3. Label in McL.'s writing, *Anisocentropus dilucidus McLach.* Example with expanded wings.

Anisocentropus illustris McLachlan, 1863, p. 494.

LECTOTYPE ♂. Circular label " S " (Salwatty). Rectangular label, " N. Gui., Wallace ". Saunders, 68.3. Label in McL.'s writing, *Anisocentropus illustris McLach.*

Ascalaphomerus finitimus McLachlan, 1862, p. 304.

LECTOTYPE ♂. N. China, 54.8. Label in McL.'s writing, *A. finitimus McL.* LECTOALLOTYPE ♀. N. China, 54.8.

The lectotype now lacks one antenna and the other is broken and gummed to the left eye. The costal edge of the left fore wing is damaged. The lectoallotype has only the bases of the antennae left and the left fore wing and tip of hind wing are damaged.

Heteroplectron californicum McLachlan, 1871, p .125.

Kimmins & Denning, 1951, p. 130 (♂ holotype, ♀ allotype = LECTOTYPE ♂, LECTOALLOTYPE ♀).

Fam. LEPTOCERIDAE

Adicella moestella (McLachlan). See ***Setodes***.

Adicella reducta (McLachlan). See ***Setodes***.

Athripsodes commutatus (McLachlan). See ***Leptocerus***.

Athripsodes cuneorum (McLachlan). See ***Leptocerus***.

Athripsodes inaequalis (McLachlan). See ***Leptocerus***.

Athripsodes interjectus (McLachlan). See ***Leptocerus***.

Erotesis baltica McLachlan, 1877, p. 326.

LECTOTYPE ♂. McL. type-label (mauve). Oesel, Nolcken. Label in McL.'s writing, *Erotesis baltica McL.* B.M. 1938–674. Printed label (blue), Erotesis baltica McLach., det. McLachlan.

Type with abdomen gummed to card.

Erotesis (?) melanella McLachlan, 1884, p. 38.

LECTOTYPE ♂. McL. type-label (pink). São Barnabe, 12/5. Eaton, Portugal, 1880. Label in McL.'s writing, *Erotesis melanella McL.* B.M. 1938–674. Printed label (blue), Erotesis melanella McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Hudsonema amabilis (McLachlan). See **Tetracentron**.

Leptocerus cognatus McLachlan, 1862, p. 306 ; 1868*a*, p. 212.

LECTOALLOTYPE ♂. McL. type-label (pink). Christchurch, N.Z., Fereday. Label in McL.'s writing, *Notanatolica cognata McL.* B.M. 1938–674.

Present combination. *Notanatolica cognata* (McLachlan), synonym of *Notanatolica magna* (Walker).

Leptocerus commutatus McLachlan, 1877, p. 308.

LECTOTYPE ♂. McL. type-label (mauve). Saxony. Label in Rostock's writing, *Leptocerus commutatus Rost.* Label in McL.'s writing, *commutatus McL.* B.M. 1938–674. Printed label (blue), Leptocerus commutatus McLach., det. McLachlan.

Present combination. *Athripsodes commutatus* (McLachlan).

Leptocerus cuneorum McLachlan, 1884, p. 34.

LECTOTYPE ♂. McL. type-label (mauve). Almodovar, 8/5. Eaton, Portugal, 1880. Label in McL.'s writing, *Leptocerus cuneorum McL.* B.M. 1938–674. Printed label (blue), Leptocerus cuneorum McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Athripsodes cuneorum* (McLachlan).

Leptocerus exiguus McLachlan, 1862, p. 307.

Mosely & Kimmins, 1953, p. 263 (♂ type = LECTOTYPE ♂).

Present combination. *Symphitoneuria exigua* (McLachlan).

Leptocerus inaequalis McLachlan 1884, p. 34.

LECTOTYPE ♂. McL. type-label (mauve). Almodovar, 8/5. Eaton, Portugal, 1880. Label in McL.'s writing, *Leptocerus inaequalis McL.* B.M. 1938–674. Printed label (blue) Leptocerus inaequalis McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Athripsodes inaequalis* (McLachlan).

Leptocerus interjectus McLachlan, 1881, p. cxxx.

LECTOTYPE ♂. McL. type-label (mauve). Bouillon, 10/7. Label in McL.'s writing, *Leptocerus interjectus* McL. B.M. 1938–674. Printed label (blue), Leptocerus interjectus McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Present combination. *Athripsodes interjectus* (McLachlan).

Leptocerus lusitanicus (McLachlan). See ***Setodes.***

Mystacides leucoptera McLachlan, 1884, p. 37.

LECTOTYPE ♂. McL. type-label (mauve). Lago di Garda, 1.viii.81. Label in McL.'s writing, *Mystacides leucoptera McL.* B.M. 1938–674. Printed label (blue) Mystacides leucoptera McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Notanatolica cognata (McLachlan). See ***Leptocerus.***

Oecetis intima McLachlan, 1877, p. 331.

LECTOTYPE ♂. McL. type-label (mauve). Krasnowodsk. Label in McL.'s writing, *Oecetis intima McL.* B.M. 1938–674. Printed label (blue), Oecetis intima McLach., det. McLachlan.

Oecetis unicolor (McLachlan). See ***Setodes.***

Setodes argentifera McLachlan, 1871, p. 129.

LECTOTYPE ♂. McL. type-label (pink). NW. India, Horne. Label in McL.'s writing, *Setodes argentifera* McL. B.M. 1938–674.

Setodes argentipunctella McLachlan, 1877*a*, p. 105.

LECTOTYPE ♂. McL. type-label (pink). Muckross, Killarney, 18.viii.77, A. E. Eaton. Label in McL.'s writing, *Setodes argentipunctella McL.* B.M. 1938–674. Printed label (blue), Setodes argentipunctella McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Setodes lusitanica McLachlan, 1884, p. 40.

LECTOTYPE ♂. McL. type-label (mauve). Ponte de Morcellos, 12/6. Eaton, Portugal, 1880. B.M. 1938–674. Printed label (blue), Setodes lusitanica McLach., det. McLachlan.

Present combination. *Leptocerus lusitanicus* (McLachlan).

Setodes moestella McLachlan, 1868, p. 298.

LECTOTYPE ♂. McL. type-label (pink). Zeller, Carinthia. 26/6/67. Label in McL.'s writing, *moestella McLach.* B.M. 1938–674. Printed label (blue), Adicella filicornis Pict., det. McLachlan. LECTOALLOTYPE ♀. Date 4/6/67, otherwise as for male.

Present combination. *Adicella moestella* (McLachlan), synonym of *Adicella filicornis* (Pictet).

Setodes reducta McLachlan, 1865, p. 120.

Kimmins, 1949, p. 35 (♂ type = LECTOTYPE ♂).
Present combination. *Adicella reducta* (McLachlan).

Setodes unicolor McLachlan, 1868*a*, p. 203.

Mosely & Kimmins, 1953, p. 301 (♂ type = LECTOTYPE ♂).
Present combination. *Oecetis unicolor* (McLachlan).

Symphitoneuria exigua (McLachlan). See **Leptocerus.**

Tetracentron amabile McLachlan, 1868*a*, p. 201.

LECTOTYPE ♂. Christchurch, N.Z., Fereday. Label in McL.'s writing, *Tetracentron amabilis McL., Type.* B.M. 1938–674. LECTOALLOTYPE ♀. Same data.

The type has the right wings missing (? removed by McLachlan for figuring) and the allotype has the right wings between celluloid.

Present combination. *Hudsonema amabilis* (McLachlan).

Triaenodes reuteri McLachlan 1880, p. lxv.

LECTOTYPE ♂. McL. type-label (mauve). Sweden. P. Wg. Label in McL.'s writing, *Triaenodes reuteri McL.* B.M. 1938–674. Printed label (blue), Triaenodes reuteri McLach., det. McLachlan.

Family SERICOSTOMATIDAE

Brachycentrus albescens McLachlan, 1876, p. 256.

LECTOTYPE ♂. Petropol. Kolenati. B.M. 1938–674. Printed label (blue), Brachycentrus albescens McLach., det. McLachlan. LECTOALLOTYPE ♀. Data as for male but with additional written label, *Hydronautia albicans Kolen.*

Dinarthrum ferox McLachlan, 1871, p. 118.

Mosely, 1939, p. 335 (♂ holotype = LECTOTYPE ♂).

Helicopsyche lusitanica McLachlan, 1884, p. 28.

LECTOTYPE ♂. McL. type-label (pink). Eaton, Portugal, 1880. Label in McL.'s writing, *Helicopsyche lusitanica McL.* B.M. 1938–674. Printed label (blue), Helicopsyche lusitanica McLach., det. McLachlan.

Helicopsyche revelieri McLachlan, 1884, p. 29.

LECTOTYPE ♂. McL. type-label (pink). Porto Vecchio. Label in McL.'s writing, *Helicopsyche revelieri McL.* B.M. 1938–674. Printed label (blue), Helicopsyche revelieri McLach., det. McLachlan. LECTOALLOTYPE ♀. Data as for male but lacking McL.'s written label.

Micrasema (?) exiguum McLachlan, 1876, p. 265.

LECTOTYPE ♀. McL. type-label (mauve). Zeller. R. 16/7. Dasystoma nigrum Br. 44. lit. 4.59. Label in McL.'s writing, *Micrasema* (?) *exiguum McL.* B.M.

1938–674. Printed label (blue), Micrasema minimum McLach., det. McLachlan.
Synonym of *Micrasema minimum* McLachlan.

Micrasema longulum McLachlan, 1876, p. 263.

LECTOTYPE ♂. McL. type-label (mauve). Saxony. Label in McL.'s writing, *Micrasema longulum McL.* B.M. 1938–674. Printed label (blue), Micrasema longulum McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.
Both lectotypes have the right wings missing.

Micrasema minimum McLachlan, 1876, p. 264.

LECTOTYPE ♂. McL. type-label (mauve). Mittenwald, Eaton. Label in McL.'s writing, *Micrasema minimum McL.* B.M. 1938–674. Printed label (blue), Micrasema minimum McLach., det. McLachlan.

Micrasema moestum (Hagen) McLachlan, 1884, p. 25.

LECTOALLOTYPE ♀. Spain, Sierra de Gredos. B.M. 1938–674. Printed label (blue), Micrasema moestum Hagen, det. McLachlan.

Micrasema morosum (McLachlan). See ***Oligoplectrum***.

Micrasema scissum McLachlan, 1884, p. 26.

Kimmins & Denning, 1951, p. 136. (♂ holotype = LECTOTYPE ♂).

Micrasema tristellum McLachlan, 1876, p. 261.

LECTOTYPE ♂. McL. type-label (mauve). Bionassay, 23/7. Label in McL.'s writing, *Micrasema tristellum McL.* B.M. 1938–674. Printed label (blue), Micrasema tristellum McLach., det. McLachlan.
Lectotype has right wings missing.

Notidobia griseola McLachlan, 1871, p. 112.

Kimmins & Denning, 1951, p. 139 (♂ type = LECTOTYPE ♂).
Present combination. *Sericostoma griseolum* (McLachlan).

Oligoplectrum morosum McLachlan, 1868, p. 297.

LECTOTYPE ♂. McL. type-label (mauve). Zeller, Carinthia. 17/7/67. Label in McL.'s writing, *Micrasema morosum McL.* B.M. 1938–674. Printed label (blue), Micrasema morosum McLach., det. McLachlan. LECTOALLOTYPE ♀. McL. type label (pink). Zeller, Carinthia. 10/7/67. Label in McL.'s writing, *D. morosum McL.* B.M. 1938–674. Printed label (blue), Micrasema morosum McLach., det. McLachlan.
Present combination. *Micrasema morosum* (McLachlan).

Pseudoeconesus mimus McLachlan, 1894*a*, p. 239.
Mosely & Kimmins, 1953, p. 114.

LECTOTYPE ♀. McL. type-label (pink). 11. Wellington, New Zealand. Label in McL.'s writing, *Pseudoeconesus mimus McL.* B.M. 1938–674.

Lectotype has left wings mounted between celluloid and abdomen mounted as a microscope preparation. The preparations are figured in Mosely & Kimmins, 1953.

Pseudoeconesus stramineus McLachlan, 1894*a*, p. 240.
Mosely & Kimmins, 1953, p. 109.

LECTOTYPE ♂. McL. type-label (pink). 12*b*. New Zealand, Hudson. Label in McL.'s writing, *Pseudoeconesus stramineus McL.* B.M. 1938–674. LECTOALLOTYPE ♀. Mt. Arthur, New Zealand, 2800 ft., 19/1/86. Label in McL.'s writing, *Pseudoeconesus stramineus McL.* B.M. 1938–674.

The male lectotype has right fore wing and left hind wing mounted between celluloid and abdomen mounted as a microscope preparation. The allotype has the left wings between celluloid and abdomen mounted as microscope preparation.

Pycnocentria aureola McLachlan, 1868, p. 200.

Mosely & Kimmins, 1953, p. 82 (♂ type = LECTOTYPE ♂).
Present combination. *Pycnocentrodes aureola* (McLachlan).

Pycnocentria evecta McLachlan, 1868, p. 35.

Mosely & Kimmins 1953, p. 37 (♂ type = LECTOTYPE ♂).

Pycnocentria funerea McLachlan, 1866*b*, p. 252.

Mosely & Kimmins, 1953, p. 40 (♂ type = LECTOTYPE ♂).

Pycnocentrodes aureola (McLachlan). See **Pycnocentria.**

Schizopelex furcifera McLachlan, 1880, p. xlviii.

LECTOTYPE ♂. McL. type-label (mauve). Pyrenees, 15/6. Eaton, 1878. Label in McL.'s writing, *Schizopelex furcifera McL.* B.M. 1938–674. Printed label (blue), Schizopelex furcifera McLach., det. McLachlan. LECTOALLOTYPE ♀. Data as for male but date 11/6.

Sericostoma griseolum (McLachlan). See **Notidobia.**

Sericostoma hamiferum McLachlan, 1876, p. 232.

LECTOTYPE ♂. Dartmoor, Leach. Labels in Mosely's writing, *CO-TYPE, Sericostoma hamiferum McL.*, det. M. E. Mosely and *See McL., Mon. p. 232, found in series of S. personatum Spence.* LECTOALLOTYPE ♀. Dartmoor, Leach. *CO-TYPE, Sericostoma hamiferum McL.*, det. M. E. Mosely.

McLachlan, in his original description, expresses doubt as to the locality label and suggests that the specimens were from N. Italy.

Synonym of *Sericostoma galeatum* Rambur.

Sericostoma subaequale McLachlan, 1898*a*, p. 49.

LECTOTYPE ♂. Tirol, 31.vii.81. B.M. 1938–674. Printed label (blue), Sericostoma subaequale McLach., det. McLachlan. LECTOALLOTYPE ♀. Date 30.vii.81, otherwise as in male.

Silo fumipennis McLachlan, 1865, p. 83.

LECTOTYPE ♂. Kent, Sutton-at-Hone, 10.vi.1864, R. McLachlan. 16/64. B.M. 1938–674. Printed label (blue), Silo nigricornis Pict., det. McLachlan. LECTOALLOTYPE ♀. Same data.

These specimens no longer bear any label indicating that they were originally the type-series of *Silo fumipennis* McL., but I have no doubt that they are the specimens referred to by McLachlan.

Synonym of *Silo nigricornis* (Pictet).

Silo mediterraneus McLachlan, 1884, p. 23.

LECTOTYPE ♂. McL. type-label (pink). Apennino Pistojese, 27.vii.1882, Eaton. Label in McL.'s writing, *Silo mediterranea McL.* B.M. 1938–674. Printed label (blue), Silo mediterraneus McLach., det. McLachlan. LECTOALLOTYPE ♀. Same data.

Thremma gallicum McLachlan, 1880, p. lviii.

LECTOTYPE ♂. McL. type-label (mauve). Le Lioran, 26/7. Eaton, 1878. Label in McL.'s writing, *Thremma gallicum McL.* B.M. 1938–674. Printed label (blue), Thremma gallicum McLach., det. McLachlan. LECTOALLOTYPE ♀. Pyrenees, 20/6, other labels as in male.

The allotype lacks its abdomen.

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BY

D. E. KIMMINS

Pp. 127–136 ; 8 *Text-figures*

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NEW SPECIES OF THE GENUS *DICERCOMYZON* DEMOULIN (EPHEMEROPTERA, FAM. TRICORYTHIDÆ)

By D. E. KIMMINS

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EARLY in 1954, Dr. G. Demoulin published a preliminary account of an extraordinary nymphal Ephemeropteron, under the name *Dicercomyzon femorale.* His specimens were from the Belgian Congo. When I received his paper, I already had in manuscript a description of a similar nymph from Nyasaland, which was subsequently published (Kimmins, 1955) as *Dicercomyzon* sp. The publication of these two papers attracted interest in these forms, and I have since received from Dr. M. T. Gillies examples of two more species from Tanganyika Territory and have found examples of the genus in collections made by Professor L. Berner in the Gold Coast. Dr. Demoulin has suggested that *Caenis ? sjoestedti* Ulmer from Kilimanjaro should be transferred to *Dicercomyzon* and Dr. Philip Corbet has informed me that he has seen examples of the nymphs in Uganda. The genus appears therefore to be fairly widespread in Equatorial Africa.

Dr. Demoulin had only a partly-transformed female subimago in addition to his nymphs upon which to base his generic diagnosis, so that the material which I have received from Professor Berner and Dr. Gillies represents a considerable advance in our knowledge of the genus. I should like to take this opportunity of thanking them both most sincerely for providing me with this material. I should also like to thank Dr. Demoulin for his kindness in answering a number of queries which I submitted to him and for sending me photocopies of more detailed drawings of *D. femorale* from a paper he had in manuscript.

To Demoulin's diagnosis of the genus (1954, 1954*a*) one can add that the eyes of the male are large, globular, set laterally on the head, with a diameter greater than the length of the head. The male forceps are two-segmented, terminal segment longer and narrower than the basal, set fairly wide apart on the forceps-base. Penis-lobes fused, stout, tapering or barrel-shaped in ventral view. Titillators acute, about as long as basal segment of forceps, extending beyond apex of penis-lobes.

Dicercomyzon femorale Demoulin

I have seen nymphs which I refer to this species from the following Gold Coast localities :

Afram R., Mankrong, 13.ix.1950, (7) ; Koloe Stream, 18.viii.1950, (4) ; Asuboni Stream, Asuboni, 14.ix.1950, (1) ; Animi Stream, Bepong, 12.ix.1950, (1).

Dicercomyzon costale sp. n.

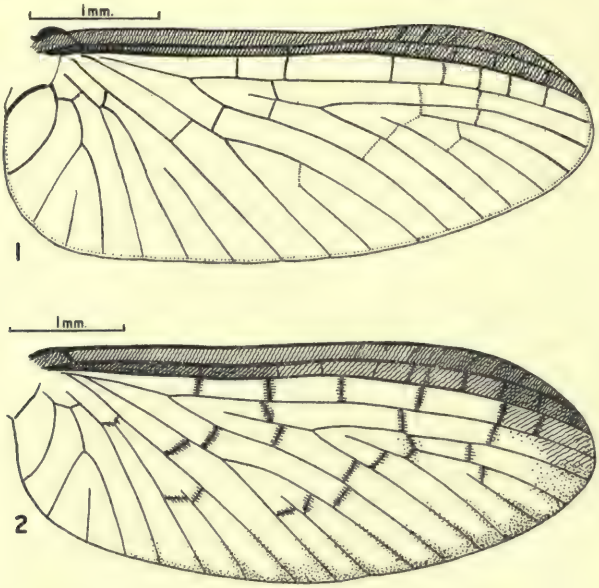
(Text-figs. 1, 3)

Dicercomyzon sp., nymphs, Kimmins, 1955, *Ann. Mag. n. H.*, (12) **8** : 876–878.

Gold Coast. Afram R., Mankrong, 13.ix.1950, 205 ♂, 89 ♀, 14.ix.1950, 18 ♂, 5 ♀ (*Lewis Berner*).

Tanganyika Territory. Amani, 3,000 ft., 31.iii.1956, 1 ♂ and nymph-skin; Amani, R. Dodwe, 20.vi.1953, 1 ♀ and nymph-skin; Gonja, 8.vii.1952, 3 nymphs, x.1952, 3 nymphs, 23.x.1952, 1 ♀ (*M. T. Gillies*).

Nyasaland. Namwere, 11.viii.1952, 4 nymphs (*Lewis Berner*).



Figs. 1–2. Wings of (1), *Dicercomyzon costale* sp. n. and (2), *D. marginatum* sp. n.

The Gold Coast material consists largely of subimagines, many partly transformed to imagines, and some imagines.

♂ imago (in alcohol). Head fuscous, short and broad, eyes large and globular, set laterally, diameter of eye greater than length of head. Antennae ochraceous. Pronotum fuscous, short, about as wide as head without eyes, posterior margin with a wide, rounded, median excision. Meso- and metanota shining fuscous. Legs ochraceous, apices of femora with three fine black lines, one dorsal, one ventral and one transverse, apical. Fore leg a little shorter than either mid or hind leg (96 : 117 : 123). Claws dissimilar, one hooked, the other large and blunt. Wing hyaline, venation pale fuscous to whitish, costal and subcostal areas warm brownish. Recurrent membrane of wing not projecting beyond apex of mesoscutellum. Venation as in Text-fig. 1. Abdomen fuscous, tergites II–VIII each with a pair of median, hyaline spots at the base, sternites slightly paler. Cerci white, shaded with pale fuscous at base. Forceps-base pale fuscous, forceps white.

♂ GENITALIA. Forceps-base with apical margin slightly excised at centre. Forceps two-segmented, basal segment globularly swollen in basal two-thirds, terminal segment about twice as long as basal, its apical two-thirds slightly dilated and its surface finely reticulated and set with microscopic setae. Penis-lobes fused to form a subquadrate plate, a little shorter than the basal segment of forceps. From beneath, the sides are slightly convex and the apex is roundly bilobed. On either side of the penis-lobes is a large, acute titillator, about twice as long as the penis-lobes.

♂ SUBIMAGO (in alcohol). Coloration of body much as in imago. Wings slightly smoky, with brownish costal margin as in imago. A short recurrent membrane extending beyond apex of mesoscutellum.

♀ IMAGO (emerging from subimaginal skin, in alcohol). Head fuscous, short, broad, eyes globular, smaller than in male. Thorax light reddish brown. Legs ochraceous, with blackish markings as in male. Wings with costal border paler.

♀ SUBIMAGO (in alcohol). Darker than imago, wings as in male subimago with rather longer recurrent membrane. Subgenital plate parabolically rounded.

Length of wing, ♂, 4–6 mm.

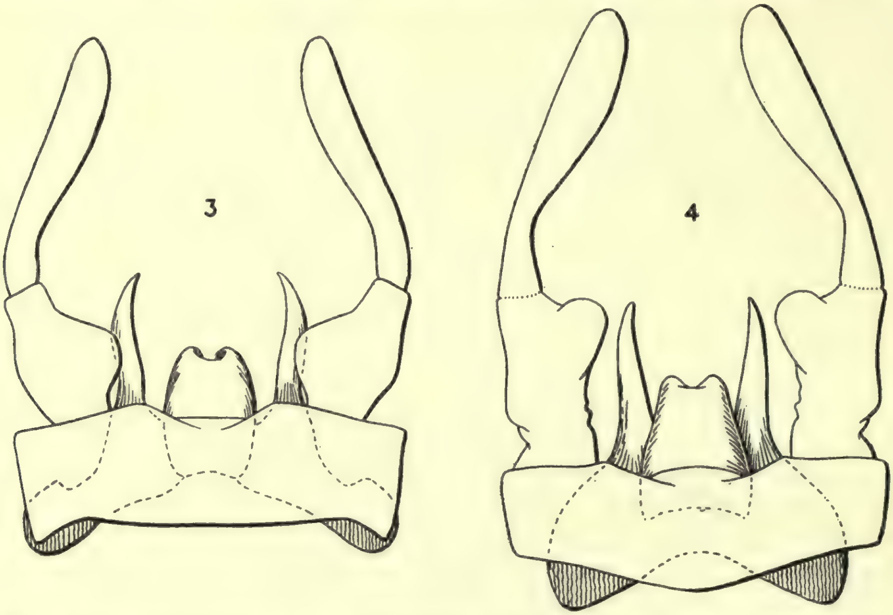
Dr. M. T. Gillies has sent me the following descriptions of the living insect, made from Tanganyika specimens. MALE IMAGO. "Thorax buff, fore legs yellow, other legs pale grey, with a minute, reddish brown spot at femoral tip. Abdominal tergites I–VIII white centrally, posterior margin narrowly mauve, broadening out laterally, IX–X sooty brown; sternites white; basal forceps segment yellow, distal segment white. Tails very long, yellow at base, white distally. Body, 4·5 mm.; wing, 5 mm.; tails 14–15 mm." FEMALE IMAGO. "Thorax and abdomen chestnut-brown, fore legs brown in distal half, pale basally, mid and hind legs with a brown knee spot." MALE SUBIMAGO. "Wings and body sooty grey, tails translucent white, yellowish at base, fore legs pale yellow, others pale grey."

♂ holotype (imago), ♀ allotype (subimago), Mankrong, 13.ix.1950, in British Museum (Nat. Hist.), paratypes in Brit. Mus. (N.H.) and University of Florida. The nymphs from Tanganyika Territory agree reasonably well with those described by me as *Dicercomyzon* sp. from Nyasaland. The Tanganyika nymphs appear to have single-segmented maxillary palpi, whereas those from Nyasaland are two-segmented. However, the maxillary palpi in this genus are so much reduced in size as to be probably non-functional and I therefore do not attach any great importance to this difference. Nymphs from both localities have the abdominal tergites slightly elevated along the median dorsal line, a character shared with *D. femorale*. The imagines from the Gold Coast are slightly smaller than those from Tanganyika but there appears to be no difference in the male genitalia. These facts have led me to associate the Nyasaland nymphs with *costale* rather than with some nymphs with narrower femora from Koloe Stream, Gold Coast, which appear to belong to the following species (*D. marginatum*). Both nymphs show a darkening of the costal border of the wing-pads.

The ♀ subimago may be separated from that of *D. femorale* Demoulin by the dark band along the costal margin of the wing. The nymphs resemble those of *femorale* but differ in the processes of the wing-pads, which project over the margin and in the more rounded basal angles of the labium.

Dicercomyzon marginatum sp. n.

Tanganyika Territory. E. Usambara Mts., Amani, Sigi R., 31.viii.1951, vii.1952, xii.1952, i.1953, vii.1953, 1 ♂ imago, 1 ♂, 2 ♀ subim., 4 nymphs; Amani, Forest stream, 2,900 ft., 26.vi.1953, 2 ♀; Amani Forest, Lion stream, vii.1951, 1 ♀; Amani, Kisuga Stream, 900 ft., 2,800 ft., 5.vi.1951, 2 nymphs; Gonja, 26.x.1954, viii.1955, 1 ♂, 1 ♂ subim.; tiny stream by Monga-Denena Rd., 17.viii.1952, 1 nymph; S. Pare, Sassaneh R., 5,000 ft., 21.v.1955, 3 nymphs; Kilimanjaro, Marangu, 25.x.1954, 4 nymphs; Arusha, under stone, 1.i.1956, 1 nymph, all collected by *M. T. Gillies*.



Figs. 3–4. ♂ genitalia, ventral of (3), *Dicercomyzon costale* sp. n. and (4), *D. marginatum* sp. n.

Gold Coast. Koloe Stream, 1 8.viii.1950, 4 nymphs (*Lewis Berner*).

♂ imago (in 2% formaldehyde solution). Head pale fuscous, marked with darker fuscous at antennal bases and between ocelli. Antennae whitish. Eyes greyish lavender. Prothorax fuscous. Meso- and metathorax ochraceous with paler markings. Legs pale ochraceous, tinged with fuscous at knees. Fore leg slightly shorter than hind leg. Wing hyaline, venation fuscous, paler in anal area; costal area, base and apex of subcostal area and apical margin of wing more or less brownish, cross-veins margined with brown. Abdomen above with segments I–VIII whitish or faintly tinged with pinkish, IX pale fuscous, X darker, II–VIII with the outer apical angles filled with a roughly triangular, pale brownish patch, not reaching the anterior border and enclosing a whitish spot around the spiracles on II–VI. Abdomen beneath whitish, faintly fuscous laterally. Forceps-base and forceps whitish, cerci whitish at base, soon becoming pale fuscous.

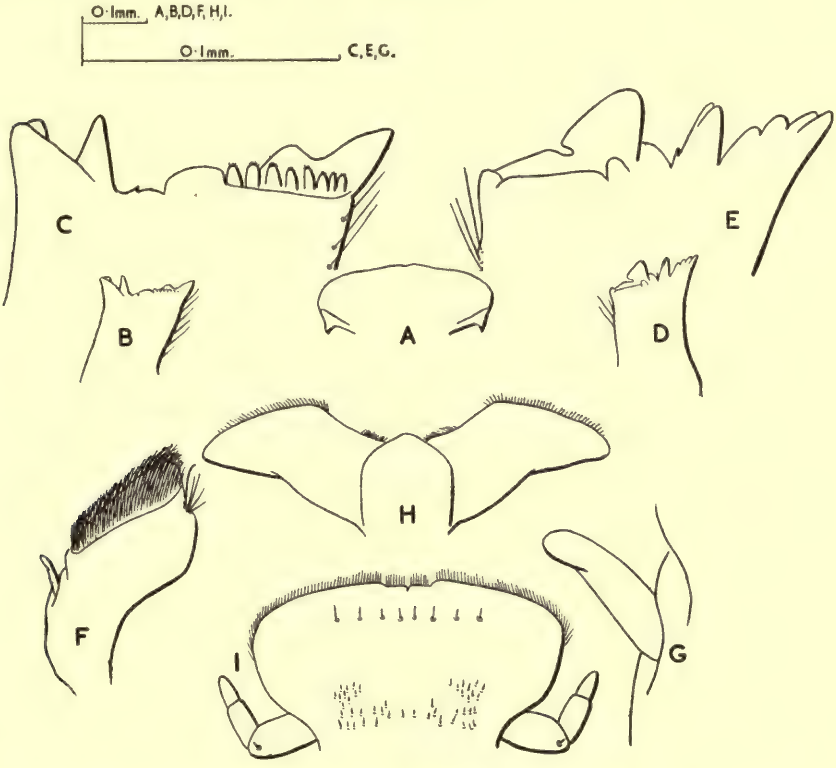


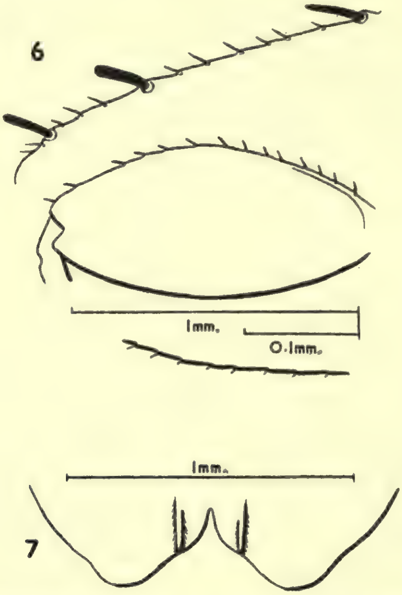
FIG. 5. *Dicercomyzon marginatum* sp. n. Nymphal mouthparts. (A), labrum; (B, C), right mandible, ventral; (D, E), left mandible, ventral; (F), right maxilla, ventral; (G), maxillary palp; (H), hypopharynx; (I), labium.

♂ GENITALIA similar in structure to *D. costale*. The joint between basal and terminal segments of forceps obscurely indicated. The basal segment is dilated on its inner surface, nearer the apex than in *D. costale*, slightly longer. Penis-lobes fused, tapering towards the excised apex; titillators acute, about as long as basal segment of forceps.

♂ SUBIMAGO. General colour pale fuscous, with piceous thorax. Eyes grey-black. Ocelli margined with blackish. Thorax with very pale fuscous, membrane between the sclerites. Wing smoky brownish, very slightly darker along costal margin, venation pale fuscous, cross-veins in centre of wing bordered with purplish brown. Legs with femora pale fuscous, dorsal and ventral margins darker, tibiae and tarsi very pale fuscous. Abdomen above fuscous, with pale sutures, beneath paler. Forceps pale fuscous.

♀ IMAGO. Coloration of wings much as in male but with brownish suffusion of apical margin lacking. Abdomen pale fuscous, with a reddish suffusion above.

MATURE NYMPH. General colour tawny yellow, faintly shaded with fuscous. Eyes black, ocelli margined internally with blackish. Wing-pads containing dark, crumpled wings. Mouthparts somewhat resembling those of *D. femorale*. The maxillary palp is one-segmented. The apical margin of the labium is more rounded than in *D. femorale*, with rounded apical angles. The armature of the ventral surface differs, the median group of teeth being replaced by a transverse row. Wing-pads reaching apex of fourth abdominal segment, inner apical margin of each carrying a short, raised, longitudinal ridge, not extending beyond the margin. Femora thin, flattened, elongate-oval, narrower than in *D. costale*, margins finely setose, dorsal also with sparse, longer setae. Abdomen with fringed gills on segments II–VI, which are narrower and pointed. Apical margins of tergites with blunt setae, forming a dense patch on each side of a bare median line, elsewhere sparse. Cerci yellowish.



FIGS. 6–7. *Dicercomyzon marginatum* sp. n., nymph. (6), mid femur, with dorsal and ventral armature, more enlarged ; (7), apex of wing-pads.

IMMATURE NYMPH paler, wing-pads with costal margin of included wing shaded with pale purplish, darker at base and apex.

Length of wing, ♂, 5 mm.

♂ holotype (Sigi R., 2.vii.1953) in 2% formaldehyde solution, one wing mounted dry, and paratypes in British Museum (Nat. Hist.). The male differs from *D. costale* in the more extensive brownish suffusion of the wing, which has margined cross-veins, and in the differently formed genitalia.

With an earlier consignment of *Dicercomyzon* material, Dr. Gillies sent the following note on the habits of the nymphs.

" Nymphs of this genus are very common in streams in the forested areas of the eastern Usambara mountains. They harbour almost exclusively on the underside of fallen leaves held up in the current by twigs and branches or wedged between small rocks. They are found in tiny forest trickles at Amani, 3,000 feet, in water less than an inch deep and in the main Sigi River at all levels down to 700 feet, which is the lower border of the forest. Leaves are seldom held up anywhere except near the surface and only where there are obstructions that cause turbulence and eddy formation. Consequently by their choice of habitat the nymphs live under conditions of maximum aeration and, in contrast to *Prosopistoma*—another lotic form—die very rapidly in still water. For this reason their safe transport to the laboratory for rearing presented considerable difficulties and more than a year elapsed before the first adult was successfully bred out."

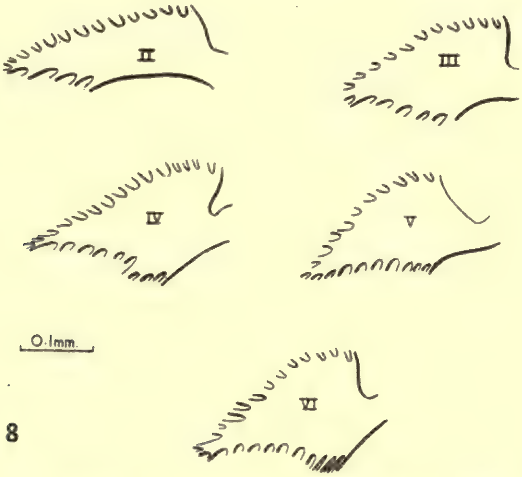


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FIG. 8. *Dicercomyzon marginatum* sp. n. nymph. Outlines of gills of abdominal segments II–VI, filaments omitted.

Professor Lewis Berner has sent me the following details of the Afram River, at Mankrong, where he took *D. costale* abundantly.

" River flows over boulders and rock outcrops, forming a small cascade, not impressive but nice. River about 100 to 150 feet wide, rather shallow at the rocks, but deeper above and below. Banks heavily wooded. River shallow enough at low water for trucks to drive across. I was told that the river was exceptionally low for this time of year ; it should be 8 to 10 feet higher. Flow at the cascades is as rapid as the less swift sections of the Kpong rapids in the Volta River. Mayfly nymphs were present but scattered. Fauna and conditions in the river reminiscent of those of the Dayi River. There was little vegetation in the water. Water relatively clear, banks of yellow, moderately coarse sand. Tsetse flies numerous. Caught mayflies on porch of rest house which faces stream and is about 200 feet from the river. Began to come about 6.45 p.m. on into evening. The small blackish adults were very numerous after 8.30 p.m."

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NATURAL HISTORY

REVISION OF THE NEOTROPICAL ACANTHOCININI (COLEOPTERA : CERAMBYCIDAE)

II. THE GENUS *LAGOCHEIRUS*

LAWRENCE S. DILLON

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BY

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REVISION OF THE NEOTROPICAL ACANTHOCININI (COLEOPTERA : CERAMBYCIDAE)

II. THE GENUS *LAGOCHEIRUS*

By LAWRENCE S. DILLON

AMONG the most primitive Western Hemisphere members of the tribe Acanthocinini is the genus *Lagocheirus*, whose components are confined chiefly to Central America and the extreme north-western portion of South America. Only one or two species are known from north of Mexico, where they occur as distinct subspecies of Mexican forms ; in the West Indies, the situation is quite similar, but showing the influence of both Mexico and South America. In addition, one member of the genus is widely distributed throughout the South Pacific, its range extending as far north as the Hawaiian Islands. While this latter species is actually, of course, not " Neotropical " in any sense of the word, its close relationship to those which are found in this region dictates its inclusion here.

Primitive features of the genus include, first of all, the median position of the lateral pronotal tubercles. Others equally indicative of primitiveness are the complexity of the pronotal and elytral sculpturing, the breadth of the mesosternal and prosternal process, the loose association of the body parts, the coarseness of the body structure, the armature of the sixth antennal segment, the broad front, and the declivous vertex. To *Lagocheirus*, the genera of the *Leptostylus-Leptostylopsis* complex are most closely related, being differentiated by the lack of an appendix on the antenna, by the less prominent sculpturing of the pronotal disk, and, in the case of *Leptostylus*, by the more posteriorly-placed lateral tubercles.

Materials for this study have been received largely from the British Museum (Natural History) [BM], through the courtesy of J. Balfour-Browne. To supplement these, specimens were loaned to the author from the American Museum of Natural History [AMNH], the United States National Museum [USNM], Chicago Natural History Museum [CMNH], Academy of Natural Sciences of Philadelphia [ANSP], Cornell University [CU], and the California Academy of Sciences [CAS]. The author wishes to express his appreciation to the gentleman named above and to the curators of the other collections (Mont Cazier, George Vogt, Rupert Wenzel, Harold J. Grant, Jr., Henry Dietrich, and Hugh B. Leech for their courtesy in arranging the loans for him. Especially thanks are extended to Ing. F. de Zayas, of Havana, Cuba, for his generous gift of Cuban specimens.

DESCRIPTIVE PHRASEOLOGY

In order to avoid needless repetition, the following terms (italicized) will be employed for characteristics that are found in all or most of the species :

On the pronotum are several short fuscous vittae : of these one set (*basal vittae*) is found each side of the middle at base, extending forward to about the basal third from the margin and usually angulate, and another set (*apical vittae*) is directly opposite these near the apical margin and placed more or less strongly obliquely. Additional fuscous or coloured vittae may also be present.

On the elytra may be present a varying number of the following fuscous or dark brown markings : *scutellar maculae* are often found laterally near the apex of the scutellum. At about the basal fourth extending transversely across the suture is a rather narrow *postbasal plaga.* The largest marking on these organs is the *lateral macula* which covers the better portion of the base of the sides and which before middle extends to a greater or lesser degree on to the disk. Just behind this but close to the suture may be an irregular *sutural macula,* which may be joined by a usually indistinct, undulating *postmedian fascia.* At the apical fourth the latter is paralleled by a similar (but rather more distinct) *preapical fascia.*

On the antennal segments the annulation is in terms of pale pubescence markings, although actually the only true annuli present are the dark ones toward the apices of the segments. However, not only does this practice follow that of earlier workers, it is quite a bit more convenient than its converse would be. In most species, the males bear an appendix at the apex of the sixth segment which is of some considerable constancy for any specified form, at least within certain limits. In statements as to the length of the appendix, the tuft of hairs upon it is not taken into consideration.

KEY TO GENERA RELATED TO *Lagocheirus*

1. Head with vertex strongly declivous ; antennal scape short, scarcely reaching behind middle of pronotum, not gradually clavate 2
   Head with vertex only slightly declivous ; scape elongate, extending nearly or quite to basal sulcus of pronotum, slender, gradually clavate from base to apex *Lagocheirus* Erichson
2. Prosternum with a transverse cariniform process at middle . . *Sternocheirus* gen. n.
   Prosternum simple . . . . *Archlagocheirus* gen. n.

Lagocheirus Erichson

Lagocheirus Erichson, 1847, *Archiv. Naturg.* **13**, 1 : 144. Thomson, 1860, *Class. Ceramb.* : 6, 9 ; 1864, *Syst. Ceramb.* : 355. Lacordaire, 1872, *Gen. Col.* **9** : 759, 762. Leng & Hamilton, 1896, *Trans. Amer. Ent. Soc.* **23** : 115. Dillon, 1956, *Ann. Ent. Soc. Amer.* **69** : 136.

Lagochirus Erichson, 1873, *LeConte, Smiths. Misc. Coll.* **11** (265) : 337. Horn, 1880, *Trans. Amer. Ent. Soc.* **8** : 117. Bates, 1880, *Biol. Centr.-Amer., Col.* **5** : 144. Casey, 1913, *Mem. Col.* **4** : 303.

Large or very large, robust, subdepressed beetles with head usually punctate only around eye ; front ranging from one-tenth to one-half again as broad as tall ; eye with lower lobe subquadrate, erect or transverse. Pronotum strongly transverse, often twice as broad across lateral tubercles as long ; lateral tubercles usually robust, prominent, sometimes small, rounded, always situated at middle of sides ; disk punctate, with five prominent tubercles ; transverse sulci shallow, the apical one placed close to margin. Scutellum subtriangular, truncate or rounded at apex. Elytra with basal gibbosity quite evident ; disk distinctly punctate, usually granulate at base, costae not prominent, as a rule bearing numerous tufted tubercles especially basally and apically, one or two basal ones on gibbosity much larger than the rest ; apices broadly truncate, the angles sometimes subdentate ; humeri prominent. Prosternal process two-fifths or one-half as broad as a procoxal cavity, longitudinally concave, simple ; mesosternal process ranging from four-fifths as broad to slightly broader than a mesocoxal cavity, sometimes bituberculate anteriorly ; fifth sternite as long as or slightly longer than fourth in male, distinctly longer in female. Legs successively longer posteriorly ; femora robust, clavate apically, pedunculate basally ; tarsi with first segment slightly shorter than next two together, mesotarsi with first segment a little longer than the second and third combined ; in male protarsi strongly expanded and fringed and protibiae densely fringed apically as well. Antennae ranging from one and two-thirds to more than twice as long as body, slender, fringed beneath only on first two segments and sometimes at extreme apex of third ; scape slightly elongate, extending a little beyond middle of pronotum, slender, gradually clavate apically ; third segment about one-sixth longer than first ; fourth subequal to (or feebly longer than) first, rest gradually shorter, the sixth usually bearing an appendix at apex in the male.

Type species : *Lagocheirus plantaris* Erichson, by monotypy.

KEY TO NEOTROPICAL SPECIES

1. Body beneath glabrous medially, the integument black or piceous, especially on abdomen ; mesosternal process strongly declivous anteriorly, its lateral beading rugose . . . . (rogersi group) 9
Body beneath pubescent medially as well as laterally, the integument dark ferrugineous ; mesosternal process less strongly declivous anteriorly, its lateral beading not at all rugose . . . . (araneiformis group) 2
2. Antennal fourth segment biannulate with ashy . . . . (undatus complex) 3
Antennal fourth segment either entirely ashy or broadly singly annulate with that colour . . . . (araneiformis complex) 8
3. Eye with upper lobe distinctly wider than interocular space 4
Eye with upper lobe at most subequal to interocular space in width . . . 5
4. Elytral apices strongly emarginate, the outer angle dentate ; elytra behind base with a dense white plaga . . . . *wenzeli*
Elytral apices at most feebly emarginate, usually subtruncate, the outer angle not at all dentate, disk without white plaga . . . . *dezayasi*
5. Elytra covered with erect flying hairs ; Pacific Islands . . . . *zimmermani*
Elytra without erect flying hairs 6
6. Pronotum with punctures outlined with white, basal vittae long and distinct ; scutellum with a distinct vitta each side . . . . *undatus*
Pronotal punctures not white outlined, basal vittae short, not extending far before basal sulcus ; scutellum without vittae 7

7. Pronotum and elytra basally irregularly maculate with bright fulvous; elytra with a patch of snowy-white pubescence medially; antennal sixth segment in male without an appendix . . . . *simplicicornis*
Pronotum and elytra dull lead grey pubescent, without fulvous maculae or white areas; antennal sixth segment of male appendiculated . . . . . *procerus*
8. Elytra with a broad, white, common fascia behind middle; pronotum as coarsely punctate on disk as at apex and base; head and pronotum strongly maculate with fulvous . . . . *foveolatus*
Elytra without a white, common fascia; head and pronotum rarely maculate with fulvous, the colour usually dull and not extensive when present; pronotal disk much more finely punctate than at apex or base . . . . . *araneiformis*
9. Mesosternal process anteriorly with a pronounced tubercle each side . . . 10
Mesosternal process not tuberculate 11
10. Elytral surface nearly black, costae vittate with bright fulvous or ochraceous; abdominal vitta broken into maculae on each sternite . . . . . *rosaceus*
Elytral surface bright ferruginous, costae not vittate; abdominal vitta interrupted only at base of first sternite. . . . . *praecellens*
11. Tarsi with integument distinctly paler than that of tibia, usually having a golden appearance 12
Tarsi with integument as dark as or darker than that of tibia, never appearing golden 13
12. Scutellum entirely blackish; pronotal lateral tubercles more or less rounded, low, usually at least twice as broad as high; elytral lateral macula sharply defined *plantaris*
Scutellum blackish medially, margins narrowly paler; pronotal lateral tubercles conical, nearly as high as broad; elytral lateral macula indistinct . . *tuberculatus*
13. Tarsi fuscous pubescent, only the first segment ashy-annulate; elytra with basal gibbosity strongly tumid, subhemispherical; body beneath with lateral pale vitta broad, continuous from back of metasternum to apex of fourth abdominal sternite, except for an interruption on base of first sternite . . . *cristulatus*
Tarsi with at least the first two segments entirely ashy pubescent; elytral basal gibbosity not very prominent, usually only feebly elevated; body beneath with lateral pale vitta broken into a transverse macula on each sternite . . . 14
14. Scutellum broadly vittate with fuscous each side; elytra with lateral macula very irregular in outline, often incised posteriorly, basal granules near suture extending to or behind middle . . . . *rogersi*
Scutellum entirely fuscous except for basal angles and narrow pale margins; elytra with lateral macula smooth in outline, rarely shallowly incised posteriorly, basal granules not extending to middle . . . . *integer*

ARANEIFORMIS GROUP

In this group, the integument of the body beneath is reddish-brown, not glabrous medially, and the prosternal and mesosternal processes are not rugose on the lateral beading. The antennae are somewhat more elongate, with at least the sixth segment attaining elytral apex in the male, and the seventh in the female.

The Undatus Complex

In this group of species, the tarsi are fuscous with at least the first two segments ashy pubescent. The antennae are biannulate on the fourth segment and frequently on the third to fifth or sixth as well.

Lagocheirus undatus undatus (Voet)

Cerambyx undatus Voet, 1778, *Cat. Col.* **2** : 11, pl. 9, fig. 34 ; 1794, ed. Panzer, **3** : 27, pl. 9, fig. 24.
Lagocheirus obsoletus Thomson, 1860, *Class Ceramb.* : 10. [**Syn. n.**]
Lagochirus obsoletus Thomson. Bates, 1880, *Biol Centr.-Amer., Col.* **5** : 145, 383.
Lagochirus longipennis Bates, idem.

MALE. Dark reddish-brown, densely covered dull ashy brown or fulvous pubescence. Head on vertex with two small interocular fuscous maculae. Pronotum with apical vittae slender, sometimes sinuous, set at an angle of 45° to the median line ; basal vittae twice as broad, somewhat narrowed anteriorly, broadly angulate ; a short median basal vitta or macula also present as a rule, lateral basal markings indistinct ; punctures and the vittae margined with whitish. Scutellum with two fuscous vittae, sometimes poorly defined, extending to base from sides near apex ; basal angles whitish. Elytra nearly uniformly dull brownish or ochraceous pubescent, punctures, especially on apical half, narrowly outlined with whitish, postbasal impression frequently tinged with ashy or sometimes nearly entirely pale ashy ; postbasal plaga indistinct or wanting ; circumscutellar maculae and postmedian fascia lacking, and preapical fascia reduced and indistinct ; lateral macula usually fairly prominent, dark brown, as a rule accentuated with fuscous along its anterior margin and on disk, posteriorly sinuous or irregular, usually followed by some whitish pubescence ; sutural macula sublinear, feebly oblique, often reduced ; costae often brighter fulvous pubescent. Body beneath and legs densely dull whitish pubescent, faintly mottled with brown ; sternum tinged on sides with brown or fulvous ; tibiae bimaculate (metatibiae trimaculate) with dark brown on outer edge. Antennae with first segment, and often most of third, ashy and brown pubescent, scape indistinctly fuscous annulate apically ; rest fuscous pubescent, fourth to sixth (or rarely seventh) biannulate with ashy, as is the third occasionally ; seventh to eleventh with a single ashy annulus which (from above) is no broader than apical fuscous portion.

Head scarcely impressed between eyes ; front finely, rather densely, quite evidently punctate, broadly convex, one-third wider than high, near eye with several coarse setigerous punctures ; eye with lower lobe one-third again as tall as gena, distinctly higher than wide. Pronotum with disk transversely tumid, the five tubercles equally elevated, finely punctate except on tubercles, the apical and basal rows distinctly coarser. Elytra finely, usually densely granulate-punctate from extreme base to basal third, thence punctures simple, fine, and less dense to apex ; apices truncate or emarginate, the angles scarcely prominent ; discal carina entire or confined to apical half, bearing 10–12 very low tufts ; rest of surface very rarely provided with long, flying hairs (in only two cases, both from Jalapa) ; basal gibbosity scarcely evident, provided with a single large tubercle at base. Antennae with sixth segment attaining (or slightly surpassing) elytral apex ; scape attaining basal third of pronotum ; third segment one-fourth again as long as first ; fourth one-fifth shorter than third ; rest strongly diminishing in length, sixth segment with appendix slender, elongate, at least equal in length to width of segment, subparallel-sided, often expanded apically. Protibiae densely fuscous-fringed.

FEMALE. Pronotal disk scarcely tumid, the tubercles of disk more sharply elevated. Antennae with seventh segment attaining elytral apex. Protibiae and protarsi not fringed.

Length 15–21 mm.; width 6–8·7 mm.

Type localities: "Indiis Orientalibus" [*undatus*]; Mexico [*obsoletus*]; R. Sarston, British Honduras [*longipennis*].

DISTRIBUTION. From North Central Mexico to Nicaragua.

Mexico: 1, no further data [CAS]. 1, Los Mochis, Sinaloa, July 7 [CAS]. 3, Venedio, Sin., July–Aug. [CAS; USNM]. 2, Tamazunchale, S.L.P. [CMNH]. 1, Ocotlan, Jalisco, Aug. [CAS]. 3, Colonia, Guerrero, Nov. 16 [CAS]. 1, Chilpancingo, Guerrero [BM]. 3, Cuernavaca, Morelos, Oct. [CAS]. 1, Tepotzlán, Morelos [CMNH]. 1, Colima, Nov. 24 [AMNH]. 1, Tehuacan, Puebla, July 6 [CMNH]. 2, Jalapa, Vera Cruz [BM]. 1, Oaxaco, July 24, 5,000 ft. [CAS]. 1, Almalonga [BM].

Guatemala: 1, El Naranjo, Chic., July 12, on *Cinchona* [USNM]. 1, San Geronimo [BM].

Honduras: 1, Zamorana, Morazán, 2,600 ft. on papaya, July 16 [USNM].

Nicaragua: 1, Chontales [BM].

Lagocheirus undatus mariorum Dillon, ssp. n.

FEMALE. Differing from the type form only as follows: Pubescence of body above and below longer and coarser, causing a shaggy appearance. Eyes with upper lobes distinctly wider than interocular space. Pronotum with lateral tubercle more obtuse, rounded at apex and without a process; discal tubercle less prominent; basal vittae of nearly uniform width throughout. Scutellum with black vittae attaining apex, not attaining base. Elytra with tufts more numerous and longer; apices distinctly obliquely truncate. Prosternal process less than half as broad as procoxal cavity, while in the typical form it is more than half. Body beneath with mottling somewhat more pronounced, especially medially. Antennae with only the fourth and fifth segments biannulate.

Length 12·5–14 mm.; width 5–5·2 mm.

Holotype: Female; Maria Madre Island, Tres Marios Islands, Mexico, May 21, 1923 (H. H. Keifer) [CAS].

Paratype: Female; same data as holotype [CAS].

Lagocheirus dezayasi Dillon, sp. n.

Lagocheirus obsoletus Thomson. Gahan, 1895, *Trans. Ent. Soc. Lond.*: 130 [misdet.].

MALE. Resembles *obsoletus* very closely, differing only in the following details. Pronotum with apical vittae obsolete or wanting; punctures not outlined with white. Scutellum without distinct vittae but broadly and vaguely tinged with dark brown on each side. Elytral pubescence largely pale ashy, so that the whitish margin of the apical punctures scarcely contrasts with it; postbasal plaga usually wanting; lateral macula often so pale as to be hardly evident. Body beneath strongly mottled with dark brown, sometimes the latter colour predominating over the pale ashy.

Eye with upper lobe one-fourth to one-half again as broad as interocular space. Pronotal disk with punctures sparser, usually wanting between the several basal tubercles. Elytral apices never emarginate, the angles not at all prominent. Antennal sixth segment with appendix usually shorter than width of segment, rarely slightly exceeding it.

FEMALE. Differs in much the same manner as does the male.

Length 13–18 mm.; width 6–7·5 mm.

Holotype: Male; environs of Havana, Cuba, on Cassava, *Manihot esculenta*, (F. de Zayas) [author's collection].

Allotype: Female; Cayamas, Cuba, May 1922 [ANSP].

Paratypes: 4, Cuba [BM]. 1, Havana (T. Cockerell) [AMNH].

Lagocheirus zimmermani zimmermani Dillon

Lagocheirus zimmermani Dillon, 1952, *Ent. News*, **63**: 207.

MALE. Identical to *obsoletus obsoletus* except as follows: Pubescence of body above in general distinctly brown or fulvous, not ashy; across basal half of pronotum and on entire elytron with numerous, long, erect, pale brown hairs. Pronotal disk less strongly tumid, the discal tubercles more distinctly elevated; disk with punctures quite numerous between the basal tubercles. Scutellar vittae poorly defined. Elytra with two or three strongly pronounced carinae at base; the apical carinae likewise more prominent; basal tubercle much larger; tufts longer and more densely situated. Antennae with scape not fuscous annulate at apex; third segment never distinctly biannulate; fourth and fifth distinctly, sixth usually not at all but rarely indistinctly, biannulate; sixth segment with appendix usually quite small, never much longer than width of segment, slender.

FEMALE. Differing from females of *O. obsoletus* in much the same fashion as do the corresponding males.

Length 11–14 mm.; width 5–6·2 mm.

Type locality: Honolulu, Oahu, Hawaiian Islands.

DISTRIBUTION. The Hawaiian and Society Islands.

Hawaii: 2, no further data [BM]. 8, Honolulu [CAS]. 1, Kahaluu, Oahu, July 7 [CAS]. 2, Napoopoo [ANSP].

Tahiti: 1, Fontana Valley, 2,500 ft., Mar. 13 [BM].

Moorea: 1, no further data [BM].

REMARKS. The two Society Island specimens above are slightly paler in colour than typical examples.

Lagocheirus zimmermani aukena Dillon, ssp. n.

MALE. From the typical form, this is distinguished by the apical vittae of the pronotum being absent or obsolete and by the presence on the middle portion of the elytron of a considerable amount of whitish pubescence. The lateral macula of the elytra also is paler.

Length 18 mm.; width 7·6 mm.

Holotype: Male; Aukena Is., Mangareva Islands, June 26, 1934, on breadfruit [BM].

Lagocheirus wenzeli Dillon, sp. n.

MALE. In general similar to *obsoletus*, differing chiefly as follows: Pronotum, scutellum, and elytra on basal fifth chocolate-brown pubescent. Pronotum with three fine, short vittae (one at centre and one above lateral tubercle), and a number of small, irregular, scattered maculae of ochraceous; apical vittae anteriorly recurved toward sides, narrower posteriorly; basal vittae rather broad, straight, only attaining base of discal tubercles. Scutellum without fuscous markings. Elytra with postbasal plaga vague, followed nearly to middle by a transverse area of dense white tomentum, which is tinted here and there with ochraceous; the white also outlining the lateral macula and forming rounded maculae over entire apical half of elytron; sutural macula indistinct; the usual tufts are replaced by small, irregular, fuscous maculae, some of which also are arranged transversely in the customary position of the preapical fascia. All three pairs of tibiae with a broad whitish annulus before middle. Antennae with only third and fourth segment biannulate.

Head with front nearly planate, one-fourth again as wide as high; eye with lower lobe quadrate, about one-third again as tall as gena, upper lobe nearly one-half again as wide as interocular space. Pronotum with median discal tubercle quite small, scarcely a fifth as large as the others. Elytra with basal gibbosity and all carinae feebly elevated; basal tubercle quite large, prominent; apices broadly, transversely emarginate, the outer angle briefly dentate. Prosternal process three-eighths as broad as a procoxal cavity, deeply sulcate, especially anteriorly. Antennae with fifth segment attaining elytral apex; third segment nearly half again as long as first; fourth feebly shorter than third; rest gradually diminishing in length; sixth segment with appendix much longer than width of segment, tapering apically.

Length 25 mm.; width 10 mm.

Holotype: Male; near Compostela, Nayarit, Mexico, June 29, 1933 [CMNH].

REMARKS. It is a pleasure to name this species for Rupert Wenzel, of the Chicago Museum of Natural History, from whom the author has received many favours.

The species is distinguished by the narrowly separated eye, the dentate elytral apex, the quadrate lower ocular lobe, as well as by the maculation of the pronotum and elytra. Particularly, the presence of fuscous maculae in place of tufts on the elytral carinae is diagnostic.

Lagocheirus procerus (Casey)

Lagochirus procerus Casey, 1913, *Mem. Col.* **4**: 304.
Lagocheirus procerus Casey. Dillon, 1956, *Ann. Ent. Soc. Amer.* **40**: 140, fig. 3.

MALE. Much larger than *obsoletus* but in general quite similar to that species. From it, *procerus* is distinct in having the pubescence of the body above largely whitish, tinged irregularly with brown. Pronotum with punctures not outlined with whitish, apical vittae fine, rather short, set at an angle of about 60° ; basal vittae fine, short, extending just to base of discal tubercles ; median and lateral vittae wanting. Scutellum without vittae or other markings. Elytra with postbasal plaga indistinct, broadly interrupted at suture, its segments arcuate ; sutural macula sometimes evident, narrow, arcuate ; postmedian fascia always absent ; preapical fascia pronounced, narrow, strongly angulate ; area behind this fascia usually darker brown pubescent ; punctures only occasionally outlined with whitish. Body beneath whitish pubescent, only moderately mottled with brown laterally. Legs rather heavily mottled with dark brown. Antennae with only fourth and fifth segments biannulated.

Head on vertex between eyes distinctly impressed ; eye with lower lobe slightly transverse, scarcely exceeding gena in height, upper lobe not quite so wide as interocular space. Pronotum much more strongly transverse ; disk not so tumid, the discal tubercles much more prominent. Elytra with carinae scarcely evident, tufts short, widely spaced ; basal gibbosity rather prominent, basal tubercle fairly large. Prosternal process deeply sulcate, not more than two-fifths so broad as a procoxal cavity ; mesosternal process more strongly angulated on sides at apex. Antennae with fifth segment attaining elytral apex ; third segment one-half again as long as first ; fourth equal to third ; fifth slightly shorter than fourth ; sixth equal to scape, appendix very short, tuberculiform.

FEMALE. Antennae with sixth segment attaining elytral apex.

Length 19–28 mm. ; width 7·5–11·5 mm.

Type locality : " Probably from Lower California ".

DISTRIBUTION. Southern and Lower California.

Lower California : 18, Santa Rosa [CAS]. 8, 3 mi. north of San Pedro, July 6, 1938 (Michelbacher & Ross) [CAS]. 1, 20 mi. north of Comondu, July 23, 1938 Michelbacher & Ross) [CAS]. 2, Todos Santos, October 18, 1941 (Ross & Bohart) [CAS]. 1, Coyote Cove, Conception Bay, July 24 [CAS].

Lagocheirus simplicicornis Bates

Lagocheirus simplicicornis Bates, 1872, *Trans. Ent. Soc. Lond.* : 210.
Lagochirus simplicicornis Bates. Bates, 1880, *Biol. Centr.-Amer., Col.* **5** : 146, pl. 11, fig. 14.

MALE. Morphologically most closely related to *procerus*, but in coloration similar to *obsoletus*, from which it differs as follows : Head on vertex and around eyes, and pronotum on lateral and discal tubercles touched with silky ochraceous pubescence. Pronotum with apical vittae indistinct, short, fine ; basal vittae fine, not extending on to basal tubercles. Scutellum without vittae. Elytra with carinae ochraceous, the entire middle portion of disk snowy-white ; postbasal plaga indistinct, straight, preapical fascia somewhat pronounced, the apical portion of disk brownish ; tufts low, few in number. Body beneath ashy-white, pubescent, unmottled, laterally broadly tinged with ochraceous. Antennae with segments 3–6 biannulate, rest very broadly singly annulate with ashy.

Head with front rugosely punctate, deeply transversely impressed just above epistoma ; eye with lower lobe slightly transverse, scarcely taller than gena, upper lobe distinctly narrower than interocular space. Elytra with carinae strongly prominent on apical half ; basal tubercle large, followed by a strong carina, the other basal carinae weak ; apices broadly, arcuately truncate. Prosternal process half as wide as a procoxal cavity, deeply sulcate. Antennae with fifth segment attaining elytral apex ; third segment one-third longer than the very elongate scape ; fourth subequal to third ; fifth and following gradually shorter ; sixth without a trace of an appendix.

Length 19 mm. ; width 8 mm.

Type locality : Chontales, Nicaragua.

DISTRIBUTION. The middle portion of Central America.

Costa Rica : 1, Candelaria Valley, 500–700 m., Dec. 28, 1923, on *Bursera* (F. Nevermann) [USNM].

REMARKS. From *procerus*, to which it is very closely related, this species is distinct in having the front rugosely punctate, in the ochraceous-tinted pronotum, the arcuately truncate elytral apices, the prominent elytral carinae, and in the unarmed sixth antennal segment.

THE ARANEIFORMIS COMPLEX

In this complex the third to sixth antennal segments are either unicolorous or broadly singly annulate with ashy. On the elytra the postmedian and preapical fasciae are usually quite distinct.

Lagocheirus araneiformis stroheckeri Dillon

Lagocheirus stroheckeri Dillon, 1956, *Ann. Ent. Soc. Amer.* **69** : 138, fig. 2.

MALE. Dark reddish-brown to piceous, densely covered with greyish-brown or fulvous brown pubescence. Head, body beneath, legs, and antennal scape finely mottled with dark brown. Head above and especially on front clouded with brown ; on vertex between eyes with a pair of small, velvety black maculae, which are often more or less coalescent. Pronotum on disk sometimes broadly clouded with brownish ; apical vittae in the form of a single arc, usually twice interrupted anteriorly, basal vittae strongly angulate, broad basally, narrowed anteriorly where they are prolonged over apex of discal tubercles ; discal punctures very narrowly annulate with white. Scutellum each side basally with a large, rounded, black macula, the two together occupying most of basal half. Elytra broadly clouded with brown across base ; scutellar maculae distinct, outlining most of sides of scutellum, and often apex as well ; on base a vague fuscous area continuing the basal vittae of pronotum ; postbasal plaga rather distinct ; lateral macula prolonged a little more strongly on to disk than in *undatus*, nearly uniformly dark brown throughout, on side of disk behind humerus preceded by a whitish dot, posteriorly the discal angle not sharply pronounced, rather broadly outlined behind by whitish pubescence which is not arranged in a definite form ; sutural macula elongate, slightly oblique, much more evident than the short postmedian fascia ; preapical fascia visible but not prominent, broad suturally, strongly narrowed laterally, the undulations rounded ; behind scutellum along suture a whitish vitta extending to basal sixth ; costae with rows of very unequal-sized black tufts, that of suture continuous nearly to apex, the others broadly interrupted. Antennae uniformly ashy-brown pubescent or indistinctly annulate.

Head finely sparsely punctate ; front about one-third again as wide as high ; eye with lower lobe subquadrate, nearly one-half again as tall as gena. Pronotum twice as wide across lateral tubercles as long ; lateral tubercles broad, conical, acute, armed with a short tooth at apex ; disk not tumid, tubercles prominent, subequal, before each lateral tubercle a small cariniform fold or tubercle, punctation sparse and rather coarse. Elytra rather sparsely and moderately coarsely punctate to behind basal fifth, the punctures thence simple and gradually finer to apical third, apically punctures very shallow and sparse, nearly entirely disappearing before apex ; basal gibbosity broad, scarcely prominent, the basal tubercle rather pronounced, as are the basal carinae ; apices broadly, squarely truncate, marginal angle prominent. Antennae two-thirds again as long as body ; scape attaining apical fourth of pronotum ; third segment one-sixth to one-fifth again as long as first ; fourth subequal to first ; rest gradually shorter ; sixth segment with a rounded appendix at apex which is not so long as the thickness of segment.

FEMALE. Differs from the male only in the shorter antennae, which are nearly one-half again as long as body, in the sixth antennal segment lacking a process, as well as in the simple protarsi.

Length 13–24 mm. ; width 6–10 mm.

Type locality : Miami, Florida.

DISTRIBUTION. Southern Florida and Cuba.

Cuba : 4, no further data [BM ; CMNH]. 4, Havana (F. de Zayas) [author's coll.]. 2, Holquin [BM].

REMARKS. This subspecies is especially characterized by the sparse, relatively coarse punctation of the base of the elytra, and by the extent of the black maculation on the scutellum. Other characters usually present are the postscutellar pale vitta along the suture (often reduced in Cuban examples), the scutellar maculae of the elytra nearly encircling the scutellum, the broad white outline of the postmedian macula, and the obtusely angulated, strongly narrowed preapical elytral fascia.

The close relationship of the Cuban and Florida populations is another indication that the tropical elements now present in southern Florida possibly were absent during the Wisconsin Ice Age (see Dillon, *Science*, **123**, 1956, pp. 167–176).

Lagocheirus araneiformis araneiformis (Linné)

Cerambyx araneiformis Linné, 1767, *Syst. Nat.*, ed. 12 : 625.

FEMALE. In this form, the punctation of the elytra is much finer and denser and that of the pronotum finer, than in *stroheckeri*. On the scutellum, the black maculation is confined broadly to the basal angles. On the elytra the scutellar maculae are greatly reduced and are to be found only adjacent to the apical angles of the scutellum ; postscutellar whitish vitta absent (as it is in all the following subspecies) ;

lateral macula very finely and briefly margined with white posteriorly; postmedian fascia obsolete; preapical fascia indistinct, obtusely angulated, uniformly narrow throughout; black tufts very fine, scarcely larger than the punctures. Antennae with segments rather distinctly uniannulate; forth segment sometimes biannulate.

Length 17·3 mm.; width 8 mm.

Type locality: Jamaica.

DISTRIBUTION. Jamaica and Hispaniola.

Jamaica: 2, no further data [BM; ANSP].

Dominican Republic: 1, Higueral, Feb. 1914 [ANSP]. 1, San Francisco Mts., Sept. 15 [ANSP].

REMARKS. The Hispaniola examples approach the Cuban and Puerto Rican populations in having the elytral punctation notably coarser than topotypic specimens.

Lagocheirus araneiformis guadeloupensis Dillon, ssp. n.

MALE. Scutellum nearly as in *stroheckeri*, the basal maculae not quite so extensive. Elytra finely punctate as in the nominotype, which it also resembles in the fine black tufting; scutellar maculae nearly as extensive as in *stroheckeri*; disk broadly pale (almost white) pubescent from behind base to apical third; lateral maculae outlined rather broadly behind with a fairly wide, zigzag, white line; postmedian fascia indistinct; preapical fascia very broad, acutely angulate at suture, lateral angulation produced forward nearly as far as sutural. Antennae very broadly uniannulate; sixth segment with process quite long for the species, being nearly equal to the width of the segment.

Length 17–18 mm.; width 8–8·2 mm.

Holotype: Male; Gourbeyre, Guadeloupe [AMNH].

Allotype: Female, Guadeloupe [BM].

Paratypes: 1, Puerto Rico [CAS]. 1, Mayaguez, P. R., May (E. G. Linsley) [CAS]. 2, San Germain, P. R. [CAS].

REMARKS. The Puerto Rican examples are somewhat transitional toward the nominotype, especially in the maculation on and around the scutellum. The pale pubescence of the elytra is also not so pronounced and the preapical fascia is much narrower.

Lagocheirus araneiformis insulorum Dillon, ssp. n.

MALE. As might be expected from the many isolated populations here grouped under one name, this subspecies is poorly defined and rather heterogeneous. Pronotum with apical vittae set at about a 45° angle with the median line, nearly straight, usually not conjoined in a continuous arc. Scutellum typically entirely clouded with fuscous, sometimes with basal angles more or less broadly maculate with black. Elytra with scutellar maculae usually indistinct or wanting, sometimes as in the nominotype; lateral maculae broadly margined behind with whitish pubescent, which only occasionally produces a zigzag line; disk largely with brown pubescence, mixed with whitish in the postbasal impression; postmedian fascia indistinct; preapical fascia rather narrow, a little wider near suture, the lateral undulation produced further cephalad than the sutural, which is vague anteriorly. Antennae with segments moderately narrowly, very prominently uniannulate, sixth segment with appendix broad, slightly shorter than width of segment.

Length 15–28 mm.; width 6–11·5 mm.

Holotype: Male; St. Vincent Is. (H. H. Smith) [BM].

Allotype: Female; Leeward side, St. Vincent Is. (H. H. Smith) [BM].

Paratypes: 1, Dominica [BM]. 2, Martinique [BM]. 2, St Vincent [BM]. 1, Becquia Is. Grenadines [BM]. 1, Mustique Isl., Grenadines [BM]. 1, Costries, St. Lucia [BM]. 3, Grenada [BM]. 3, Balthagar, Grenada [BM]. 1, Mount Gay Est., Leeward side, Grenada [BM].

Lagocheirus araneiformis fulvescens **Dillon, ssp. n.**

MALE. The two mainland subspecies differ from the insular and Florida forms markedly in having the postmedian dark fascia well developed, whereas the latter usually have this band lacking or obsolete. In the present form, the pronotum as well as the elytra are covered in large part with fulvous pubescence. Scutellum with basal black markings narrow, sublinear, continuing the scutellar maculae of the elytra to form a sort of vitta. Elytra basally rather coarsely and quite sparsely punctate; apical tufts large, nearly continuous forwards to base.

Length 15–20 mm.; width 6·5–11·5 mm.

Holotype: Male; British Guiana, Jan. 18, 1912 (A. F. Porter) [CMNH].

Allotype: Female; Duserre, French Guiana (G. Moberg) [USNM].

Paratypes: 3, Trinidad [BM]. 1, North Hills, Trinidad, Nov., 1916 [CMNH]. 1, Scarborough, Tobago, May 18, 1914 [BM]. 1, Para, Brazil [ANSP]. 1, Limao, Rio Surumu, Brazil, Sept. 1927 [AMNH]. 1, Demerara, British Guiana [CMNH]. 2, British Guiana [BM]. 1, Mt. Duida, Venezuela [AMNH]. 1, Llanos de Cruz Rubiera Guarico, Venez. [USNM]. 1, Selva de San Camilo [USNM]. 2, Caracas, Venez. [ANSP]. 1, Amaya Cispata Bay, Colombia, June 3 [CAS]. 2, Colombia [CAS; USNM]. 1, Villa Vieja, Colombia, Apr. 11 [CAS]. 2, San Bernardo de Viento, Colombia, Nov. 20 [CAS]. 2, Coyaima, Colima, Col. [CAS]. 1, Sabanilla, Col. [USNM]. 8, Lake Sapatoza, Chiriguana, Col. [BM]. 1, Magdalene Valley, Col. [BM]. 1, Rio Opon, Col. [AMNH]. 1, Aracataca, Col. Aug. 11 [ANSP]. 1, Minca, Col., July 31 [ANSP]. 1, Achinamiga, Peru [AMNH]. 4, Satipo, Peru [USNM; AMNH; CAS].

REMARKS. A few of the Colombian examples show some loss of the fulvous coloration, but, as a whole, there is a rather marked line of demarcation drawn at Panama between this and the following form.

Lagocheirus araneiformis ypsilon (Voet)

Cerambyx ypsilon Voet, 1778, *Cat. Col.* **2** : 11, pl. 9, fig. 33; 1794, ed. Panzer, **3** : 26, pl. 9, fig. 33.
Lagocheirus parvulus Casey, 1913, *Mem. Col.* **4** : 304. [**Syn. n.**].
Cerambyx araneiformis auctorum.

MALE. From *fulvescens* this form is distinct only in having the elytra and pronotum dull greyish-brown pubescent and in the elytra punctation being fine and close-set.

Length 13–25 mm.; width 6–12 mm.

Type locality: America septrionale [*ypsilon*]; Nata, Panama [*parvulus*].

Distribution. Panama to Northern Mexico.

Panama: 5, Chiriquí [ANSP; CAS; USNM]. 2, La Chorrera [BM; USNM]. 1, Trinidad Riv., May 4 [USNM]. 1, Bugaba [USNM]. 1, Cabima, May 17 [USNM]. 1, Taboga Isl., Gulf of Panama, Sept 20 [BM].

Canal Zone: 1, Gamboa [CAS]. 2, Fort Clayton, June 8 [CMNH]. 1, Paraiso, Mar. 4 [USNM]. 1, Rio Chagres, June 12 [CMNH]. 9, Barro Colorado Isl. [CMNH; USNM; AMNH]. 1, Ciricito [CAS]. 1, Corazal [USNM].

Costa Rica: 1, Pacayas [ANSP]. 4, Reventazon [USNM]. 1, Bebeders [USNM]. 1, San José, Nov. 5 [USNM]. 2, La Fuente, 1200 m. [CMNH]. 1, Cartago, June 9 [CAS].

Nicaragua: 1, La Libertad, Chontales [CAS]. 1, Managua [USNM].

Guatemala: 5, El Salto, Escuintala [CAS]. 1, Toconicapan [CAS]. 1, Vol. de Atitlan (Champion) [BM]. 1, Torola [BM]. 1, Piedros Negros [USNM]. 1, Capetillo, 5,000 ft. Aug. 21 [AMNH]. 3, Variedades, Sept. 1 [AMNH]. 2, San Marcos, April [CAS].

Honduras: 3, San Pedro Sula [ANSP]. 1, La Ceiba, Nov. 10 [USNM].

British Honduras: 1, Cayo [BM]. 1, Punta Gorda [CAS].

Mexico: 8, Cordoba, V. C. [CAS]. 1, Palo Gacho, V. C. [USNM]. 3, Penuela, V. C., July 15 [CMNH]. 1, Yanga, V. C. [CMNH]. 1, Merida, Yucatan [BM]. 1, Chichen Itza [CMNH]. 2, Almolonga [BM; USNM]. 1, Trece Aguas, on *Cacao* [USNM]. 1, Cuernavaca, June [USNM]. 1, Tamazunchale, S. L. P., June 18 [CMNH]. 1, San Lorenze, V. C. [USNM]. 4, Chiapas, 800–1,000 m. [USNM]. 1, Compostella, Nayarit, Oct. 1. [CAS].

Remarks. From *granulatus*, described from Texas, this form is distinct in not having the elytron so rugose. In that subspecies, the basal granules are subequal in size to the punctures and the basal gibbosities are somewhat more prominent; moreover, the white margin of the lateral macula is very extensive, occupying much of the lateral area of the elytra as far posteriorly as the preapical fascia.

Lagocheirus foveolatus Dillon, sp. n.

Female. While resembling *araneiformis* in many respects, this species is not very closely related to that one. The present form may be distinguished by the elongate, parallel sided, subdepressed body. The head, pronotal lateral and discal tubercles, and much of elytra tinged with bright orange-fulvous. Pronotum with apical vittae indistinct. Scutellum apparently entirely blackish. Elytra with scutellar maculae wanting; postbasal plaga light brown, velvety, becoming quite broad at suture; lateral macula light brown, poorly defined, followed posteriorly by a double, white, transverse fascia extending from margin to suture, its anterior and posterior components interconnected by three or four longitudinal white lines, the posterior line accentuated by the preapical fuscous fascia; fuscous tufts nearly absent on basal third, on remainder of surface large, rounded, outlined with white. Tarsi of all legs with first two segments light orange-brown, covered with ashy pubescence.

Antennae uniannulate beginning with third segment, the annulus becoming quite narrow on apical segments.

Head with front subplanate, about one-tenth wider than high; eye with lower lobe obliquely transverse, as tall as gena, upper lobes one-third broader than interocular space. Pronotal lateral tubercles moderate in size, with a prominent, somewhat retrorse, obtuse tooth at apex. Elytra with basal gibbosity feebly elevated, broad, carinae on entire disk obsolete; apices broadly truncate, the angles not at all prominent; punctures very coarse, becoming subfoveolate laterally on basal gibbosity. Prosternal process five-eighths as broad as a procoxal cavity, scarcely impressed on posterior half, deeply so anteriorly. Antennae with sixth segment slightly surpassing elytral apex; third segment one-fourth again as long as first; fourth distinctly shorter than third; rest strongly decreasing in length.

Length 32 mm.; width 12 mm.

Holotype: Female; Chiriquí, Panama [USNM].

REMARKS. This species is distinct from all the other members of this group in having the two basal segments of all tarsi pale; however, the mesosternal process is simple as in other related forms. Furthermore, the transverse white fascia, and the coarse punctures of the elytra are distinctive; the latter become small foveae on the posterior portion of the basal gibbosity, especially laterally.

ROGERSI GROUP

In this group the integument of the body beneath is black or virtually so, medially glabrous or very sparsely pubescent, the pubescence laterally dense and forming maculae or vittae, often of a bright colour. The mesosternal process is strongly declivous anteriorly and often impressed posteriorly, with the lateral beading rugose (as is that also of the prosternal process); in two species, *rosaceus* and *praecellens*, there is a pronounced tubercle each side of the anterior declivity. In the two species mentioned and in *rogersi* the tarsal segments are fuscous, but in the rest the tarsi are golden-yellow, at least in large part. The antennae as a rule are quite short, scarcely surpassing the apex of the elytra, but *praecellens* and *rosaceus* are exceptional in this respect too, having the sixth segment attaining the elytral apex.

Lagocheirus rogersi rogersi (Bates)

Lagochirus rogersi Bates, 1880, *Biol. Centr.-Amer., Col.* **5**: 146, pl. 11, fig. 15.

MALE. Dark reddish-brown to piceous, densely covered with dull lead-grey or olive-grey pubescence. Head above and on front varied with pale ochraceous as is also the pronotal disk to a slight degree. Pronotum with apical vittae abbreviated, often indistinct, not oblique, basal vittae broad, short, extending just across basal sulcus. Scutellum with two tapering fuscous vittae which often are coalescent at extreme base. Elytra with postbasal plaga obsolete or wanting; lateral plaga evanescent anteriorly, elsewhere sharply defined, variably incised posteriorly, outlined behind by a fine whitish line, which bifurcates at the incision and forms a sort of prostrate letter Y, the two rami of equal width; sutural macula and postmedian fascia wanting; preapical fascia broad, typically broken into an elongate sutural portion and a subquadrate lateral macula, often indistinctly interconnected. Body beneath piceous, sparsely hoary pubescent, with transverse yellow maculae laterally on metasternum and first four abdominal segments. Tarsi fuscous, first two (and sometimes last) segments covered with ashy pubescence ; femora and antennal scape covered with ashy pubescence, mottled with brown ; tibiae broadly biannulated with ashy ; antennae with third and fourth segments biannulated, rest uniannulated.

Head with front slightly convex, one-third again as wide as high ; eye with lower lobe broadly oblong, erect, two-thirds again as tall as gena, upper lobes subequal in width to the interocular space. Pronotum gradually narrowed to apex where it is scarcely wider than an elytron ; lateral tubercles small, ending in a short, subacute spine which is directed upwards and slightly forward ; disk subrugose, coarsely punctate except on the five prominent tubercles, the median one being most highly elevated. Elytra with basal gibbosity rather prominent, armed at base with a large, projecting tubercle and laterally with a broad carina ; disk on basal fourth granulate punctate, the granules larger than the punctures, laterally attaining middle, thence punctures simple, becoming finer apically, evanescent at apical sixth, on apical three-fifths with four prominent costae, each of which bear a number of long pointed tufts ; apices separately broadly rounded. Mesosternal process slightly depressed posteriorly, anteriorly abruptly declivous, lateral beading rugose. Antennae with eighth segment attaining elytral apex ; scape attaining basal sulcus of pronotum ; third segment one-fifth longer than first ; fourth one-eighth shorter than first ; fifth and sixth much shorter, the latter with an appendix that is nearly as long as the width of the segment, broadly rounded apically, with sides parallel, and directed slightly distally, rest gradually shorter.

FEMALE. As in male but antennae only as long as body, the sixth segment without appendix ; protarsi not expanded nor fringed.

Length 16–24 mm. ; width 7·5–10 mm.

Type locality : Volcan de Irazu, Costa Rica.

DISTRIBUTION. Costa Rica.

Costa Rica : 2, no further data [BM]. 2, Guayabillos, Irazu, 2,200 m. (F. Nevermann) [USNM].

Lagocheirus rogersi panamensis Dillon, ssp. n.

Differs from the typical form in having the pronotum, base of elytra, and sternal side-pieces distinctly ochraceous maculate, but the most striking difference is in the postmedian white fascia of the elytra. Here the posterior tine of the mark is very broad, overshadowing the anterior tine to such an extent that the whole loses its resemblance to the letter Y. In addition the fuscous vittae on the scutellum broadly fused on basal half.

Length 17–24 mm. ; width 8–10 mm.

Holotype : Male, allotype female, and one paratype : Volcan de Chiriquí (Champion) [BM].

Paratype : Chiriquí, Panama [BM].

Lagocheirus rogersi hondurensis Dillon, ssp. n.

FEMALE. Very similar to the nominotypic form in having but little ochraceous pubescence on the pronotum, and to the Panama subspecies in having the scutellar vittae strongly fused at base. From both of these it is distinct in having the white pubescence behind the lateral macula irregularly arranged, not at all Y-shaped, confined largely to the lateral margin of elytron.

Length 23 mm.; width 10 mm.

Holotype: Female; Honduras, 1940 (W. von Hagen) [AMNH].

Lagocheirus integer (Bates)

Lagochirus integer Bates, 1885, *Biol. Centr.–Amer., Col.* **5**: 384.

MALE. Closely related to *L. rogersi* in structure and sculpturing, but differing as follows: Covered with fuscous pubescence, more or less distinctly varied with ashy or fulvous ashy on head, pronotum, base of elytra, body beneath, femora, and basal antennal segments. Scutellum fuscous except on basal angles and narrowly on sides. Elytra without dark markings except for the strongly accentuated lateral macula and a subobsolete preapical fascia, which is produced somewhat strongly forward at suture and usually divided into a sutural and lateral portion; lateral macula narrowly and not distinctly outlined with whitish behind, the pale line feebly bifurcated, with the posterior bifurcation narrowly separated from the anterior and frequently extending to or near suture. Beneath maculate with bright ochraceous on side of prothorax, finely on mesosternal side-pieces, broadly on metasternum each side, and narrowly on sides of first four abdominal sternites. Tarsi with all segments ashy pubescent, the integment not paler than that of tibia.

Head with front broadly, feebly convex, one-sixth wider than high; eye with lower lobe subquadrate or broadly erect, twice as tall as gena, upper lobes as broad as the interocular space. Pronotal lateral tubercles without a spine or tooth, conical, prominent; discal tubercles quite as in *rogersi*, punctation very variable. Elytra with basal gibbosity scarcely elevated, basal tubercle only slightly more evident than carina and tufts; disk rather finely and sparsely granulate-punctate, the granules subequal in size to the punctures, extending nearly to middle of elytra, each with six rows of fine tufts, often rather closely placed, on low carinae; apices separately broadly rounded or subtruncate. Mesosternal process strongly but obliquely declivous before, depressed posteriorly; lateral margins not rugose, simply punctate. Antennae with seventh segment attaining or slightly surpassing elytral apex; scape extending nearly to basal sulcus of pronotum; third segment one-fifth again as long as first; fourth subequal to first; fifth much shorter; rest gradually decreasing in length; sixth segment with appendix moderately short, not as long as width of segment, directed slightly distad.

FEMALE. Antennae with eighth segment attaining elytral apex; protarsi not fringed nor dilated.

Length 12–18 mm.; width 5·2–7·5 mm.

Type Locality: Cordoba, Mexico, herewith designated.

DISTRIBUTION. Central Mexico to Panama.

Mexico: 1, Cordoba (Sallé) [BM].

Guatemala: 5, Cerro Zunil, 4,000 ft. (Champion) [BM]. 1, Volcan de Atitlan, 3,500 ft. (Champion) [BM].

Panama: 1, Bugaba (Champion) [USNM].

REMARKS. The reduced dark maculation of the elytra, consisting only of a prominent lateral macula and an obsolete preapical fascia is, combined with the form of the mesosternum, a sufficiently diagnostic character for the recognition of this species. The dark tarsi, the low elytral gibbosity, the fairly long antennae, maculation of the scutellum, and the sculpturing of the pronotum are also characteristic.

In the single specimen from Panama the lateral maculae of the elytra scarcely contrast with the general pubescence and the scutellar dark macula is small. Furthermore the lateral tubercles of the pronotum are quite tumid, so that this form may deserve subspecific status when further material becomes available.

Lagocheirus tuberculatus tuberculatus (Fabricius)

Cerambyx tuberculatus Fabricius, 1787, *Mant. Ins.* **1** : 131. Gmelin, 1790, *Syst. Nat.* ed. 13, **1**, 4 : 1819. Olivier, 1790, *Encycl. Méth. Ins.* **5** : 291 ; 1795, *Ent.* **4**, 67 : 109, pl. 16, fig. 114.
Lamia tuberculata Fabricius. Fabricius, 1792, *Ent. Syst.* **1** : 273 ; 1801, *Syst. Eleuth.* **2** : 289.
Lagochirus tuberculatus Fabricius. Gahan, 1895, *Trans. Ent. Soc. Lond.* : 130.
Lagocheirus binumeratus Thomson, 1860, *Class. Ceramb.* : 9. Bates, 1885, *Biol. Centr.-Amer., Col.* **5** : 384.

MALE. Very similar in colour and structure to *integer*, from which form it differs chiefly as follows: Head, pronotum, and profemora usually variegate with bright ochraceous instead of ashy, rarely ochraceous ashy. Scutellum with dark macula larger, as a rule occupying all of surface except narrow basal angles and, sometimes, very narrow side margins. Elytra with lateral macula subobsolete, rarely pronounced, followed posteriorly by a narrow white line which is not bifurcated but is strongly angularly undulant, its inner portion widely remote from the macula; sutural macula dimly present (postmedian fascia absent as in *integer*); preapical fascia rather distinct, broken into two elongate, broad maculae. Tarsi variable, sometimes with surface colour identical to that of tibiae, sometimes quite pale, except at apex of last segment, and usually ochraceous pubescent.

Head with front a little more strongly narrowed between eyes; lower ocular lobes consistently erect, twice as tall as gena, upper lobes subequal to interocular space. Pronotum with lateral tubercles as in *integer*, disk with basal tubercles much more prominent than anterior ones, disk laterally more strongly tumid. Elytral basal gibbosity rather prominent, basal granule large, much more distinct than the carinae, tufts long and acute (usually); disk coarsely punctate, the granules pronounced, medially continuing almost to middle, punctures thence simple and strongly decreasing in size; apices truncate. Mesosternal process slightly rugose laterally, broadly excavated. Antennae with seventh segment nearly attaining elytral apex; scape extending only to basal third of pronotum; third segment one-sixth longer than first; fourth as long as first; fifth and sixth successively much shorter, the appendix of the latter disinctly longer than width of segment, projected distad but recurved at apex; remaining segments gradually decreasing in length.

FEMALE. As in male, but antennae with ninth segment attaining elytral apex, sixth segment without appendix; pronotum often not tumid laterally; protarsi not expanded or fringed.

Length 13–18 mm.; width 5·4–9 mm.

Type locality; " Jamaica " [*tuberculatus*]; Mexico [*binumeratus*].

DISTRIBUTION. Southern Mexico to Nicaragua.

Mexico: 1, Oaxaca [ANSP]. 1, Orizaba, Dec. 1905 [USNM]. 1, Chiapas, 800–1,000 m. [USNM]. 1, Misantla [BM]. 1, Toxpam [BM].

British Honduras: 4, Stann Creek Valley, Aug. 7, 1933 [BM]. 1, Rio Temas [BM]. 1, Belize [BM].

Guatemala: 3, no further data [ANSP]. 1, Alta Vera Paz, Mar. 24, on cacao [USNM]. 1, San Juan, V. P. [BM]. 1, San Isidro, 500 m. [BM].

Nicaragua: 4, Chontales [BM; USNM].

REMARKS. The type locality " Jamaica " appears to be erroneous; a careful comparison of Mexican specimens with Olivier's figure of the type seems to indicate that the latter is probably its place of origin.

Lagocheirus tuberculatus v-album Bates

Lagocheirus v-album Bates, 1869, *Trans. Ent. Soc. Lond.*: 386; 1880, *Biol. Centr.-Amer., Col.* **5**: 145, 384, pl. 11, fig. 11.

MALE. Differing from the typical form chiefly in having the white line of the elytra much broader and in the costae being covered with ochraceous pubescence. Tarsi always pale, covered with bright ochraceous pubescence.

DISTRIBUTION. Costa Rica and Panama.

Costa Rica: 2, Hamburg Farm, Sta. Clara Prov., June 29 [USNM]. 1, Capellodas, nr. Vinas, June [USNM].

Panama: 2, Bugaba [BM]. 2, Volcan de Chiriquí, 300 ft. [BM; CAS]. 1, Boquete, July 1939 [CAS]. 1, Chiriquí [ANSP].

Lagocheirus plantaris plantaris Erichson

Lagocheirus plantaris Erichson, 1847, *Arch. Naturgesch.* **13**: 144; White, 1855, *Cat. Col. Dist. Mus.* **8**: 365.
Trypanidius fasciculatus White, *op. cit.*: 377, pl. 9, fig. 9 [**Syn. n.**].
Lagocheirus fasciculatus White. Bates, 1863, *Ann. Mag. Nat. Hist.* (3) **12**: 101.

MALE. Related to *tuberculatus* but differing as follows: Pubescence of body above bright tawny-brown. Head, pronotum, femora, and first three antennal segments varied with fulvous or fulvous-ashy. Pronotum with apical vittae nearly wanting, basal vittae short, usually not extending to base of tubercles. Scutellum entirely black. Elytra with black maculae distinct, outlined posteriorly by a double whitish fascia which extends to suture, the two components of the fascia with many interconnections, that along suture quite broad; also with a common white macula on suture at basal third, and a smaller one usually present at basal sixth; white fascia accentuated behind by the pronounced black preapical fascia, which is rather narrow suturally, gradually widening to margin, briefly interrupted at its inner third, sometimes only visible laterally. Body beneath more densely ochraceous pubescent on sides, so that the maculae are more conspicuous. Tarsi quite pale, except apex of last segment.

Head with front one-fourth wider than high, finely punctate, feebly convex, sides scarcely narrowed between eyes; eye with lower lobe nearly twice as tall as gena, oblong, suberect, upper lobes slightly narrower than interocular space. Pronotum with sides tumid, lateral tubercles rather low, nearly hemispherical, unarmed; disk strongly tumid each side so that the anterior and posterior tubercles are interconnected, the latter one prominent, median tubercle rather low; basal punctures coarse, especially anterior row, which are twice as coarse as those of disk. Elytra with basal gibbosity a little more prominent, with the lateral but without the apical carina, basal tubercle about as pronounced as in *tuberculatus*; disk rather more coarsely punctate, the granules smaller, inconspicuous (except laterally at extreme base), usually not extending posterior to basal gibbosity; apices broadly, arcuately truncate. Mesosternal process strongly depressed posteriorly, abruptly declivous anteriorly, lateral margins distinctly rugose. Antennae with seventh segment attaining elytral apex; scape extending to basal third of pronotum; third segment just one-tenth longer than first; fourth feebly shorter than first; fifth and sixth successively much shorter than fourth; rest gradually decreasing; sixth with appendix variable in width and length, usually subequal in length to width of segment, evenly rounded at apex, sides parallel.

FEMALE. Antennae with ninth segment surpassing elytral apex, sixth without an appendix; protarsi not expanded or fringed.

Length 14–20 mm.; width 6–8 mm.

Type localities: Peru [*plantaris*]; Éga, Brazil [*fasciculatus*].

DISTRIBUTION. Columbia and north-western Brazil to Bolivia.

Colombia: 1, no further data [BM]. 1, Rio Nare, Antioquia, Jan. 4, 1939 [USNM]. 1, Villa Arteaga, July [USNM].

Brazil: 1, Amazonas [BM].

Ecuador: 1, El Partidero, Dec. 1935 [BM]. 1, Napo-Paatsza, Jan. [CAS]. 9, Loja [ANSP].

Peru: 2, Rio Santiago, Nov. [AMNH]. 1, Junin, Sani Beni, Feb. [CAS]. 1, Satipo, Jauja Prov., April [AMNH].

Bolivia: 1, Buenavista, 1,700 ft., Oct. [ANSP].

REMARKS. In many ways, especially as in regard to the tarsal coloration, this species resembles *tuberculatus*. However, in the present form, the undulating white fascia of the elytra is double, with the posterior portion outlined behind by black.

Lagocheirus plantaris indistinctus Dillon, ssp. n.

MALE. In many instances only slightly distinct from the typical form in having the basal angles of the scutellum pale or ochraceous pubescent. However, in well-marked examples the elytral pubescence is uniformly dull cinereous or fuscous, with the carinae marked with ochraceous. The most important distinguishing feature is to be found in the structure of the pronotum, which is scarcely inflated. As a consequence, the lateral tubercles are usually conical, and the tubercles of the disk are more pronounced.

Length 12–18 mm.; width 5·5–9 mm.

Holotype: Male; Gamboa, Canal Zone, June 1944 [CAS].

Allotype: Female; Barro Colorado Isl., Canal Zone, July [USNM].

Paratypes: 4, same data as allotype [USNM; CMNH-3]. 1, Parais, C. Z., Mar. [USNM]. 1, Ft. Clayton [CAS]. 1, Trinidad Riv., Panama, March [USNM]. 2, Reventazon, Costa Rica [USNM].

Lagocheirus plantaris gorgonae Dillon, ssp. n.

MALE. In general most similar to the Central American subspecies, especially in having the pronotum only feebly tumid, in the pale basal angles of the scutellum and in the ochraceous lines on the elytral carinae. However, it is amply distinct in having these lines much more marked, in the more prominent lateral maculae of the elytra, and particularly in lacking ochraceous pubescence on the abdominal sternites.

Length 14–16 mm.; width 6·5 mm.

Holotype male and allotype female: Gorgona Island, Colombia, 200 ft., at light [BM].

Lagocheirus rosaceus Bates

Lagocheirus rosaceus Bates, 1869, *Trans. Ent. Soc. Lond.*: 386.
Lagochirus rosaceus Bates. Bates, 1880, *Biol. Centr.-Amer., Col.* **5**: 146, pl. 11, fig. 12.
Lagocheirus flavolineatus Aurivillius, 1921, *Tijd. Ent.* **64**: 52, pl. 2, fig. 10 [**Syn. n.**].

MALE. Dark reddish-brown, covered above by rather sparse fuscous-ashy pubescence, strongly variegated with bright ochraceous, which forms irregular lines on the pronotum and covers the costae on the elytra. Pronotum with apical vittae distinct, straight, extending directly caudad, basal vittae very broad, somewhat arcuate. Scutellum fuscous, vittate medially with ochraceous. Elytra largely dull hoary pubescent, except for the broad brown base; postbasal plaga rather indistinct; lateral macula conspicuous, briefly margined behind with white or rosaceous; both the postmedian and the preapical fasciae broad and strongly undulant, especially at suture, where they are separated by a line of white or rosaceous, the former largely outlined with white or rosy; costae strongly marked with lines of rosaceous, interrupted by prominent tufts of fuscous hairs. Body beneath nearly glabrous medially, very sparsely covered with fine hoary pubescence; metasternum and abdominal sternites laterally transversely maculate with rosaceous. Tarsi blackish, basal two segments rosaceous pubescent. Antennae fuscous pubescent, with a faint double annulus on fourth and single ones on following segments.

Head with front tumid, very finely, sparsely punctate, one-fourth wider than high; eye with lower lobe broad, feebly upright, nearly twice as tall as gena, upper lobes separated by about one and one-half their width. Pronotum strongly tumid laterally and across disk, constricted at base; lateral tubercles broad, moderately prominent, armed with a large granule at apex; disk with tubercles indistinct except lateral basal ones, coarsely densely punctate except on tubercles. Elytra moderately densely granulate-punctate at base, the punctures deeper, rather coarse, from basal sixth simple, becoming much finer to apical third, thence subobsolete; basal gibbosity rather low, strongly carinate, the carina bearing a very large granule at base; costae distinctly prominent; apices obliquely subtruncate at suture. Mesosternal process depressed medially, lateral beading pronounced and distinctly finely rugose. Antennae with eighth segment surpassing elytral apex; scape attaining base of pronotal lateral tubercle; third segment one-fifth longer than first; fourth feebly shorter than first; fifth to seventh successively strongly shorter; rest subequal to seventh; sixth with appendix elongate, much longer than width of segment.

FEMALE. Pronotum scarcely tumid, lateral tubercles feebly prominent. Antennae with ninth segment surpassing elytral apex; sixth segment simple. Rest as in male.

Length 12–20 mm.; width 6–9·2 mm.

Type localities: Chontales, Nicaragua [*rosaceus*]; Colombia [*flavolineatus*].

DISTRIBUTION. From southern Mexico to Colombia, being of rare occurrence at the extremes of its distribution.

Mexico: 1, Oaxaca [ANSP].

Nicaragua: 1, no further data [BM]. 7, Chontales [BM].

Costa Rica: 4, Hamburg Farm, Reventazon, May-Aug. [USNM].

REMARKS. The character of the designs on the elytra will at once identify this species.

Lagocheirus praecellens Bates

Lagocheirus praecellens Bates, 1872, *Trans. ent. Soc. Lond.*: 209.
Lagochirus praecellens Bates. Bates, 1880, *Biol. Centr.-Amer., Col.* **5**: 146, pl. 11, fig. 13.

MALE. Differs from *rogersi* as follows: Pronotum and elytra ferrugineous covered with orange-ochraceous pubescence; the former with apical vittae usually short, nearly confined to apical margin, basal vittae indistinct except near margin. Scutellum with fuscous vittae narrow, confined to apical halves of margins. Elytra with basal plaga obsolete; lateral macula largely dull ochraceous pubescent, only slightly accentuated with dark brown on disk; pale markings ashy or whitish, broad, conspicuous, consisting of two common maculae (one at basal fifth, and one before middle), a broad, undulating postmedian fascia which is strongly recurved along suture for some distance, and an arcuate vitta on suture and apex; preapical fuscous fascia much narrower, strongly interrupted; apical lateral fuscous macula rather prominent. Body beneath scarcely at all hoary pubescent, laterally broadly vittate from prosternum to apex of fourth abdominal sternite, vitta interrupted on base of first sternite and often behind mesosternum. Antennae with segments 3–5 or 6 biannulated, rest with a single rather narrow annulus.

Head with front one-third wider than high, finely punctate, slightly tumid medially ; eye with lower lobe two-thirds again as tall as gena, very broad, as is also the upper lobe, broader, retrose rather than upcurved as a rule ; discal sculpturing with basal gibbosity broader, less prominent but surmounted by a more distinct crest, prolonged anteriorly to the robust basal tubercle ; disk at base coarsely punctate (especially postero-laterad of basal gibbosity), the punctures distinctly larger than the granules. Antennae with sixth segment distinctly surpassing elytral apex ; scape attaining basal sulcus of pronotum or nearly so ; third segment half again as long as first ; fourth feebly longer than first ; fifth to seventh strongly diminishing in length, sixth with appendix longer than width of segment, slightly oblique ; rest gradually feebly shorter. Mesosternal process rather deeply concave medially, strongly tuberculate each side anteriorly.

FEMALE. Differing from female *rogersi* as do the males. Antennae with seventh segment nearly attaining elytral apex.

Length 19–23 mm. ; width 9–10·8 mm.

Type locality : Chontales, Nicaragua.

DISTRIBUTION. Known only from the type locality.

Nicaragua : 4, Chantales [BM].

REMARKS. At once distinguishable from *rogersi* by the form of the prosternal process and by the fine granulation of the elytra.

Lagocheirus cristulatus Bates

Lagocheirus cristulatus Bates, 1872, *Trans. ent. Soc. Lond.* : 209.

MALE. Dark reddish-brown to piceous, densely covered with dull ashy pubescence. Pronotum with apical vittae subobsolete, fine, strongly oblique, the pair more or less forming an arcuate line ; basal vittae just attaining base of tubercles, strongly expanded to margin, with a median vitta and another each side similar in size and form. Scutellum with vittae variable in extent (possibly in relation to geography), more or less lateral and apical in position, sometimes covering most of surface except middle of apex, sometimes greatly reduced. Elytra at base vaguely, broadly blotched with fuscous, the basal plaga rarely visible ; lateral macula prominent and fuscous medially, evanescent anteriorly, partially outlined posteriorly by a narrow, indistinct, ashy line ; postmedian fascia indistinct or wanting ; preapical fascia rather broad, strongly constricted at each undulation, distinct only near suture. Body beneath sparsely pubescent or subglabrous (especially on abdomen) medially ; laterally densely covered with dull ashy fulvescent pubescence, which is broadly interrupted at base of first abdominal sternite and absent from fifth. Tarsi fuscous, broadly annulate apically with ashy on apex of first segment. Antennae with segments 3–5 or 6 biannulated, the rest uniannulated medially.

Head with front one-third wider than high, narrowed above, minutely punctulate ; eye with lower lobe subquadrate, three-fifths again as tall as gena, upper lobe two-thirds as broad as interocular space. Pronotum with lateral tubercles robust, conical, unarmed ; disk scarcely tumid, median tubercle most prominent, acute, apical tubercles least elevated, entire surface (except in basal and apical sulcus) nearly impunctate, 3 or 4 coarse punctures occurring laterally and a very few fine ones medially. Elytra with basal gibbosity very prominent, subglobular, at base with a large, often granulated tubercle; disk densely coarsely granulate-punctate on basal fourth, the punctures and granules subequal in size, punctures thence simple, much finer to middle, on apical half subobsolete; carinae rather prominent except on gibbosity, with rows of long tufts, especially basally; apices obliquely broadly truncate. Mesosternal process slightly concave, lateral beading rugose. Antennae with eighth segment not attaining elytral apex; scape reaching to basal third of pronotum; third segment one-fourth again as long as first; fourth distinctly shorter than first; fifth to seventh successively strongly shortened; sixth with appendix rather fine, not as long as width of segment; remaining segments wanting.

FEMALE. Very similar to male but protarsi are not fringed. Antennae not quite so long as body; sixth segment simple.

Length 15–21 mm.; width 7–9·5 mm.

Type locality: Chontales, Nicaragua.

DISTRIBUTION. Southern Mexico to Nicaragua.

Mexico: 1, Misantla [BM].

Guatemala: 1, Coban [USNM].

Nicaragua: 1, Chontales (Janson) [BM].

REMARKS. While in coloration this species resembles *obsoletus*, it has no close affinities to it or to any other known species of the genus. Its large basal gibbosity will at once distinguish it.

Incertae Sedis

Lagochirus unicolor Fisher, 1947, *Mem. Soc. Cubana Hist. Nat.* **8**: 38.

" FEMALE. Broadly elongate, slightly convex above, uniformly brownish-yellow, each elytron with an obsolete, narrow, oblique, whitish line along lateral margin behind middle.

" Head longer than wide and nearly flat in front, with a narrow, longitudinal groove extending from occiput to clypeus, broadly concave between antennal tubercles, which are rather strongly elevated, widely separated, and obliquely divergent; surface finely, sparsely punctate, densely, uniformly clothed with a short, recumbent, brownish-yellow pubescence; eyes separated from each other on top by three-fourths the width of upper lobe. Antenna slightly longer than body, densely clothed with short, recumbent, brownish-yellow pubescence.

" Pronotum nearly twice as wide as long, subequal in width at base and apex, widest at middle; sides parallel near base, sinuate anteriorly, with a large, triangular tooth on each side at middle; disk uneven, transversely flattened along base and anterior margin, with five obtusely rounded tubercles arranged in two transverse rows, two in front and three behind, the three posterior tubercles more strongly elevated; surface coarsely, deeply, irregularly punctate, densely clothed with short recumbent, brownish-yellow pubescence. Scutellum triangular, broadly rounded at apex, densely, uniformly pubescent.

" Elytra distinctly wider than pronotum ; sides nearly parallel from humeral angles to near the tips, which are separately broadly subtruncate, surface rather densely, coarsely, deeply punctate, densely clothed with short, recumbent, brownish-yellow pubescence ; abdomen indistinctly punctate, last visible sternite shallowly emarginate at apex ; prosternal process about one-third as wide as coxal cavity, expanded posteriorly ; femora pedunculate, strongly clavate toward apices.

" Length 18 mm., width 8 mm.

" Type locality. Barbados, British West Indies.

" Type. In the United States National Museum, No. 58123.

" Described from a single specimen found in the Wickham Collection.

" This species differs from all the other described species of *Lagochirus* in having the upper surface of the body densely clothed with uniformly brownish-yellow pubescence, without any distinct markings except for an obsolete white line on each elytron along the lateral margin behind the middle "

Sternocheirus Dillon, gen. n.

Very closely related to *Lagocheirus*, from which genus this differs as follows : Female (male unknown). Head with vertex more strongly declivous, the lower edge of anternal tubercles being scarcely above the middle of the total vertical height of head (excluding mouthparts) ; front relatively a little broader, and distinctly more strongly narrowed between eyes ; eye with lower lobe slightly wider than tall. Pronotum with lateral tubercles rather small, armed with an acicular spine ; discal tubercles comparatively feeble. Scutellum broad, sides slightly oblique, the apex evenly rounded. Elytra more elongate, covering extended fifth abdominal segment, sides subparallel, scarcely tapering ; apices together broadly rounded ; carinae wanting except on basal gibbosity, which is low and broad ; discal punctures simple except on basal sixth, where they bear feeble granules ; tufts absent, replaced by fuscous maculae which are not at all seriate except along margins. Prosternum medially with an irregular transverse, cariniform tubercle. Antennae with scape short, scarcely extending behind middle of pronotum ; third segment one-fourth longer than first ; rest gradually decreasing.

Type species : *Sternocheirus lugubris* Dillon, sp. n.

REMARKS. From *Archlagocheirus* which it resembles in the form and length of the scape, this genus differs in having the vertex less strongly declivous, the front not rugose, the pronotal disk not tumid, and in the armed prosternal process.

Sternocheirus lugubris Dillon, sp. n.

Lagocheirus funestus Thomson. Bates, 1880, *Biol. Centr.-Amer.*, *Col.* **5** : 146 [*ex parte*].

FEMALE. Piceous, densely covered with ashy-brown pubescence. Pronotum with apical vittae indistinct, subparallel, widely separated, feebly attaining margin ; basal vittae more distinct, elongate, extending on to basal tubercles. Scutellum with a rather narrow attenuate fuscous vitta each side. Elytra with basal plaga squarely transverse, narrow, poorly defined, more or less interrupted ; lateral macula obsolete, greatly reduced, indicated primarily by the more velvety texture of its vestiture; sutural macula large, elongate, composed of numerous small maculae; postmedian and preapical fasciae indistinct except in certain lights, the latter composed of undulating row of fuscous maculae; apical half of disk irregularly sprinkled with fuscous maculae (not tufts) which are outlined with white. Body beneath ashy pubescent, not mottled; abdomen medially finely fuscous. Femora narrowly biannulated with pale fulvous apically; tarsi entirely ashy-pubescent. Antennae fuscous, segments 1–5 biannulated with ashy, the remainder uniannulate.

Head with front one-fourth wider than high, strongly narrowed between eyes, finely punctate, not rugose; eye with lower lobe subrotund, narrower mesially, two-fifths again as tall as gena, upper lobe a little wider than interocular space. Pronotum coarsely, irregularly punctate at base and apex; disk unevenly, sparsely, rather finely punctate. Elytra not very densely punctate, the punctures on basal sixth bearing low granules, moderately coarse, becoming much finer thence to apex.

Length 23 mm.; width 9·7 mm.

Holotype: Female; Puebla, Mexico (Sallé coll.) [BM].

REMARKS. In several superficial ways, this species shows resemblance to *A. funestus* Thomson, particularly in the annulation of the femora and the maculation of the apical half of the elytra.

Archlagocheirus Dillon gen. n.

Most closely related to *Sternocheirus*. From that genus it is distinct in having the vertex more strongly declivous, with the lower edge of the antennal tubercle placed well below the middle of the total head height; front three-fifths again as wide as high in both sexes; rugosely punctate especially in the male; eye with lower lobe distinctly transverse, tapering mesially, in females sometimes subquadrate, always small, not so tall as the gena. Pronotum with central portion of disk abruptly and strongly tumid, particularly in the female; lateral tubercles prominent to a greater or lesser extent, armed with an acute spine. Scutellum often truncate or retuse at apex, rarely rounded. Elytra with costae obsolete, quite apparent on basal gibbosity; apices feebly truncate or rounded together. Prosternum simple, unarmed; mesosternal process gradually declivous anteriorly, medially broadly tumid, the tumescence low. Antennae with eighth segment attaining elytral apex in male, distinctly shorter than body in female.

Type species: *Lagocheirus funestus* Thomson.

REMARKS. The strongly declivous vertex, the markedly transverse front, the sculpturing of the pronotum, the declivous mesosternal process, the small eye, and the very shortened antennae in the female are especially diagnostic.

Archlagocheirus funestus (Thomson)

Lagocheirus funestus Thomson, 1865, *Syst. Ceramb.*: 545.
Lagochirus funestus Thomson. Bates, 1880, *Biol. Centr.-Amer. Col.*, 5: 146.

MALE. Black, covered with fine fuscous pubescence. Pronotum with apical vittae often wanting, always indistinct, strongly oblique, confined to anterior discal tubercles ; basal vittae also indistinct or wanting, apparently confined to basal margin ; disk often with a series of fulvous or ashy markings across base and apex which vary greatly in position and shape, usually four markings are in each transverse row. Scutellum uniformly fuscous, rarely a little paler medially. Elytral markings often indistinct ; basal plaga transverse ; lateral macula accentuated on disk and anteriorly with darker pubesence, rarely narrowly outlined with whitish posteriorly ; sutural macula continuous with the postmedian fascia, which is confined to the sutural half of disk, rather broad ; preapical fascia subobsolete, narrow, strongly undulant ; disk sprinkled with rounded fuscous maculae (not tufts) which are often narrowly outlined with white, in basal impressions and medially often, and postmedially rarely, with irregular inconstant markings of whitish or fulvous, occasionally quite broadly so. Body beneath as above, sometimes with irregular maculae of ashy or fulvous laterally. Femora biannulated with fulvous near apex, the annuli much interrupted ; tibiae often ashy-annulate at middle ; tarsi fuscous, the first two segments often sparsely ashy-pubescent. Antennae biannulate with ashy on first four segments, uniannulate on rest.

Head with front finely sparsely punctate, rugose ; eye with lower lobe one-sixth shorter than gena, upper lobes separated by twice their width ; vertex behind eye coarsely and deeply punctate. Pronotum with lateral tubercles usually prominent, armed with a long, acute spine at apex ; disk tumid in an area that includes the five prominent tubercles, apically and basally coarsely punctate, rest of surface between tubercles somewhat rugosely punctate. Elytra with basal gibbosity feeble, outlined posteriorly by a broad arcuate impression, bearing two rather prominent carinae ; basal granule large, projecting ; disk basally often rugose, on basal fourth finely granulate-punctate, the punctures thence simple and finer, evanescent apically, carinae obsolete. Antennae with eighth segment attaining elytral apex, scarcely fimbriate beneath ; scape reaching to middle of pronotum ; third segment one-fourth again as long as first ; rest gradually diminishing in length, sixth with a long, curved, tufted appendix at apex.

FEMALE. As in male, but front not rugose ; eye with lower lobe often subquadrate. Pronotum with disk only slightly tumid ; lateral tubercles less prominent. Antennae distinctly shorter than body ; third segment scarcely longer than first ; sixth simple.

Length 24–30 mm. ; width 9–12 mm.

Type locality : Mexico.

DISTRIBUTION. Known only from central Mexico.

Mexico : 1, no further data [ANSP]. 3, Cacaloapan, Puebla, 5500 ft. July 5, 1941, on cactus (H. S. Dybas) [CMNH]. 6, Cuernavaca, on *Opuntia* [USNM-2 ; TAM-4].

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BY

KARL JORDAN

British Museum (Nat. Hist.), Tring

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A CONTRIBUTION TO THE TAXONOMY OF *STENOPONIA* J. & R. (1911), A GENUS OF PALAEARCTIC AND NEARCTIC FLEAS

By KARL JORDAN

THE original diagnosis of *Stenoponia* was based on the description and figures of *Hystrichopsylla tripectinata* Tiraboschi (1902) (designated type species), of which a male had been obtained at Rome on *Mus musculus*, and on a Chinese female off *Sciurotamias davidianus consobrinus*. This generic concept has since been much widened by the inclusion of *Hystrichopsylla americana* Baker (1899) and a number of new species described since 1925.

When, in the spring of 1912, 1913 and 1914, I was in Algeria with Walter Rothschild I devoted some time to collecting mammals for the sake of their fleas. *Stenoponia* were found in three places : Hammam Meskoutine, west of Guelma, Khenchela, at the east end of the Aurès Mts., and at Guelt-es-Stel, a bordj (castle) on the route from Boghari to Djelfa. Rothschild and Hartert went in 1913 to western Algeria mainly to collect birds, but they took with them Alan Ruddle of the Mammal Department of the British Museum (Natural History), who obtained a fine series of a *Stenoponia* at Djebel Mourdjadjo at the back of Port Oran, and of another *Stenoponia* at Aïn-Séfra, far south-west near the border of Morocco. The outbreak of the war in 1914 put an end to these yearly excursions. In 1920, however, Charles Rothschild and I spent some months in Algeria and on the way from Biskra south we observed from the platform of the railway carriage *Jaculus* hopping about in a flat area which was studded with bushes growing out of little hillocks of sand. Before proceeding to Touggourt we collected for some time at an intermediate place called Djama or Djamma, and here I caught for the first time *Gerbillus hirtipes*, which sleeps during the day in such dunes as just mentioned. I got only one gerbil and it had no fleas.

In our records of Mediterranean fleas we listed the *Stenoponia* from various places simply as *S. tripectinata* Tiraboschi, 1902, without mentioning any differences we had observed. It seemed to us advisable to postpone an analysis until more abundant collections from a greater number of localities would be available. What we had in the collection seemed to show the populations to intergrade and even to overlap to a remarkable extent. The publication of the description of *S. insperata* in 1930 by Weiss of the Pasteur Institute in Tunis therefore came somewhat as a shock, but induced us to look at our *Stenoponia* again. Weiss's account, however, as well as what was said on the same Tunisian fleas soon after by Wagner (1930) and Wagner & Wassilieff (1933) left me where I was before. They cleared away some muddles about locality and hosts of Tunisian *S. insperata* and *S. tripectinata*, but avoided the taxonomic difficulties by basing the definitions of their two " species " on the somatics of majorities and neglecting the minorities which are connecting links between populations. They state, for instance, of the antepygidials of *S. insperata* " ordinairement " in male 3, female 4. As this flea is said by them to occur at Bir Mellah in the nests of *Meriones shawi* in enormous quantity, it is quite safe to assume that there is a percentage with 4 in the male and with 5 in the female, the numbers in four pairs of a very similar *Stenoponia* from Rehoboth in Israel being in the male 7 sides with 3 and 1 with 4, and in the female 5 sides with 4 and 3 with 5, and in a pair from Biskra there are 3 and 3 in the male and 3 and 4 in the female.

Much more stimulating than the Tunisian specimens are those now known from Egypt. I am profoundly grateful to Lt.-Col. Robert Traub for having entrusted me with a large number of mounted specimens of *Stenoponia* collected by Mr. H. Hoogstraal, to whom also I here express my gratitude. This remarkable collection emboldened me to write for assistance to Dr. O. Theodor, Dept. of Parasitology, Hebrew University, Jerusalem, who most generously responded by sending specimens and much information on the distribution of *Stenoponia* in Israel and their particular environment, for all of which I thank him most sincerely. When I learned from his communications that his department has a large collection of fleas (over 200 specimens of *Stenoponia*, for instance) obtained from different localities stretching from the north to the south of the country, most of them cleared and mounted, I was much astonished and greatly thankful for the opportunity to study some of them. From Iraq we have a pair kindly presented by our friend Dr. C. Andresen Hubbard and a second female collected by Dr. D. L. Harrison. The other countries of the Middle East, Syria, Lebanon, Jordan and Saudi Arabia, are as regards this enquiry complete vacua.

Section I.—Asiatic and Nearctic species. Genal comb with one angle (at base of spines 4 and 5, last (uppermost) spine in a line with the preceding ones, never projecting over the antennal fossa.

Subsection A^1.—Smallish species from the Pacific area of Palaearctic Asia. Genal comb with 9–12 spines. Oral margin less than half as long as the genal comb (36 : 100 ±). Pronotum inclusive of comb as long as metanotum (measured dorsally) or at most one-fifth longer. All tarsi of both sexes with 4 spiniforms on apical area of ventral surface.

♂. Apex of IX.st. not or feebly widened, more convex dorsally than ventrally. Ventral sclerite of phallosome without armament, not bearing the inverted claw present in all ♂ of Subsections A^2 to A^5.

♀. Posterior margin of VII.st. straight at least in its ventral third, without distinct sinus. Body of spermatheca oviform, dorsal and ventral margins evenly curved and of the same length, orifice of duct central, no transverse sclerotized stripe defining the sort of snout present in all other species of the genus.

Four species known.

1. ***Stenoponia coelestis*** J. & R., 1911

Labial palp with one segment, which reaches to the end of the maxillary palp. Number of spines in the genal comb 9 on both sides in the holotype, 10/10 in the second specimen. Pronotum inclusive of comb one-tenth longer than metanotum. Pronotal comb with 18 (or 19 ?) spines each side. On terga IV to VI of abdomen two rows of bristles and no additional bristles in front of them. Marginal spinelets on terga II to VI 7/8, 6/7, 4/5, 3/5, 0/1. Stylet with one long bristle at apex. The longest apical bristles of hind tarsal segments I and II not reaching to the apex of the segment following.

HABITAT. South-east of Ta-tsien-lu, West China, 1 ♀ from *Sciurotamias davidianus consobrinus* (Anderson leg.), another female (without abdomen) from Si-ho River, western Szechwan, off *Microtus alcinous* (now *Clethrionomys rufocanus shanseius*), presented by Oldfield Thomas, both in the Brit. Mus. (Nat. Hist.) collection at Tring.

2. ***Stenoponia formozovi*** Ioff & Tiflov (1934, ♀; Ioff & Scalon, 1954, ♂)

Labial palp with one segment. Number of spines in genal comb in four males 10/10, 10/11, 11/10, 11/11, in seven females twice 10/10, once 11/10 and four times 11/11. Pronotal comb of female with 50 spines on the two sides together. Pronotum only 1 unit* longer than metanotum. Number of antepygidials in four males 3/3, in eight females seven times 4/4 and once 5/4.

♂. Distal half of ventral arm of IX.st. narrower than proximal half.

♀. Posterior margin of VII.st. entire, vertical.

HABITAT. Amurland and Transbaikalia. Not in the Brit. Mus. (Nat. Hist.) collection. Additional information received from Dr. V. E. Tiflov and used here.

3. ***Stenoponia montana*** Darskaya, 1949

Labial palp with two segments. Number of spines of genal comb in male 10/10, in female 12/12, of pronotal comb in male 19/19, in female 25/23, of comb of abdominal tergum I in male 16/16, in female 21/20. Spinelets of abdominal terga II to VI in male 7/6, 5/6, 5/4, 3/3, 0/0, in female 8/8, 7/6, 6/6, 4/5, 0/0. Antepygidials in male 3/3, in female 4/4. On abdominal terga IV to VI two rows of bristles and some small additional ones.

♂. Ventral arm of IX.st. a little narrower distally than in middle; apex of paramere broad, with a curved-down hook in lateral aspect on slide.

♀. Stylet with one long bristle at apex. VII.st. with lower area projecting as a broad lobe which is more or less slightly incurved.

HABITAT. North Korea, on *Clethrionomys rutilus*; Nagano District, Japan, 1,500 m., November 1953, on *Apodemus speciosus*. One pair in Brit. Mus. (Nat. Hist.) from Nagano, presented by Dr. E. W. Jameson.

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* One unit equals approximately 10 μ.

4. ***Stenoponia sidimi*** Marikovsky, 1936

Like *S. montana*, but easily distinguished by sexual somatics. Some of the bristles on the underside of the apex of IX.st. of male stout and shortened, spiniform ; apex of paramere resembling a helmet with a domed crown, the posterior margin having a rounded projection directed obliquely downwards. Stylet with several long bristles at and near tip.

HABITAT. Kumwha, Korea, from *Apodemus agrarius*, *Apodemus speciosus* and *Rattus norvegicus*. Ussuri District, on Muridae, accidentally on *Eutamias*, *Cricetulus* and *Mustela*. In the collection of the Brit. Mus. (Nat. Hist.) 3 pairs from Korea presented by Lt.-Col. Robert Traub.

Subsection A².—Nearctic species. Pronotum inclusive of comb at least one-third longer than metanotum. Oral margin shorter than longest spine of genal comb. Abdominal spinelets more numerous than in other species.

♂. IX.st. widened at apex, its dorsal surface appearing straight ; as in all the following species of Section I, the ventral sclerite of the paramere with a sharp claw (each side) gradually curving upwards.

♀. Stylet with one long bristle at apex.

5. ***Stenoponia americana*** (Baker), 1899

Bristles on frons above oesophagus all minute ; on metepimere only two rows of bristles, the subapical row (below the comb of abdominal tergum I) absent ; all tarsi of both sexes with two apical spiniforms on ventral surface of segment V. These three distinctions do not occur elsewhere in the genus. Number of spines in the genal comb varying in male from 12/11 to 14/14 and in female from 12/12 to 14/15. The aggregate of spinelets on abdominal terga II to V (VI has no spinelets in this subsection) varies in our series from 71 to 95 in the males and from 76 to 118 in the females. The usual number of antepygidials is 4/4 in the male and 5/5 in the female, but 4/3, 4/5 and 5/4 also occur in the male and 5/6 and 6/5 in the female. Setose area of VIII tergum widely interrupted below stigma.

HABITAT. Canada and U.S.A. south to Alabama, but we have not seen any specimens from the western area (Oregon southward to Colorado and Arizona) and it is not recorded from this area.

6. ***Stenoponia ponera*** Traub & Johnson, 1952

On frons above the oesophagus the usual row of six or seven medium-sized bristles present. Labial palp long, consisting of at least two segments. Pronotum with two rows of bristles and one or a few small additional bristles which represent the third (anterior) row of *S. americana*. Genal comb with 14 or 15 spines according to the description, in our male and two females 14/14. Antepygidials in male 4/4, in our females 5/5 and 6/6. Spinelets of abdominal terga II to V less numerous than in *S. americana*, the aggregate being in the male 71 and in the females 52 and

60; the comparatively low numbers in the females are rather surprising. On mesepimere below the frame of second spiracle four or more long bristles instead of two or three. Pale area of metepisternum horizontally shorter than vertically broad. Metepimere with three rows of bristles. Segment V of all tarsi, both sexes, with two pairs of spiniforms on the apical ventral area.

♂. Widened apical area of IX.st. more densely setose than in *S. americana* and somewhat broader.

♀. VII.st. without distinct ventro-lateral sinus and the setose area of VIII.t. not interrupted below spiracle.

HABITAT. New Mexico, on *Peromyscus* and *Eutamias*; Durango, Mexico.

In Brit. Mus. (Nat. Hist.) 1 ♂ from Pinos Altos, New Mexico and 2 ♀ from Durango, presented by Lt.-Col. Robert Traub.

Subsection A³.—Western Siberia and Kazakhstan, group III of Ioff & Tiflov, 1934, containing two species, neither of which is represented in the British Museum. My notes on them are based on what the authors have published and on additional information most kindly given me by Dr. V. E. Tiflov.

Labial palp with two segments. Eye feebly pigmented. Oral margin longer than one-half the genal comb. Pronotum inclusive of comb as long as, or longer than, the metanotum measured dorsally. Number of spines of genal comb in males 10/10, 10/11, 11/10, 11/11, in females 10/11, 11/10, 11/11, 11/12, 12/11, 12/12, 12/13. Antepygidials in males 3/3, 4/3, 4/4, in females 4/5, 5/4, 5/5, 5/6, 6/5, 6/6, 6/7, 5/7.

♂. Digitoid (F) shorter than manubrium (M) of clasper, inserted farther upwards than in next subsection; paramere with subapical narrow beak pointed and curved down; apex of ventral arm of IX.st. strongly widened.

♀. Margin of VII.st. with deep subventral sinus, the lobe below it projecting much more than the one above it.

7. ***Stenoponia ivanovi*** Ioff & Tiflov, 1934

Genal comb in fourteen males once 10/10, twice 11/10, eleven times 11/11, in sixteen females once 10/11, once 11/10, seven times 11/11, twice 12/11, and five times 12/12, i.e. in males 4 sides with 10 and 24 with 11, in females 2 sides with 10, 18 and 11, and 12 with 12. Antepygidials in males eleven times 3/3, twice 4/3, once 4/2, in females twice 5/4, nine times 5/5, once 5/6, twice 6/5, twice 6/6, i.e. in males 24 sides with 3, 3 with 4, 1 with 2 (which is quite exceptional in the genus).

♂. Manubrium (M) of clasper boat-shaped, being widened ventrally in middle, a little more than four times as long as it is broad at the widest point. Digitoid (F) one-sixth shorter than M, its anterior margin apically distinctly slanting distad. Widened apex of IX.st. obtusely angulate at upper and lower sides, the upper angle slightly more distinct than the lower one.

♀. VII.st. with a deep subventral sinus, which is separated by a prominent lobe from a broader, rounded, second sinus, above this a shorter lobe.

HABITAT. Western Siberia: west of Minussinsk and near Urda in Kazakhstan, on *Lagurus lagurus*, *Cricetulus migratorius*, and in nests of *Microtus arvalis*.

8. ***Stenoponia suknevi*** Ioff & Tiflov, 1934

Genal comb in seven males twice 10/10, twice 10/11, once 11/10 and twice 11/11, in ten females twice 11/10, four times 11/11, twice 11/12, twice 12/13, i.e. in males 7 sides with 10 and 7 with 11, in females 2 with 10, 12 with 11, 4 with 12, and 2 with 13. Antepygidials in males once 3/3, once 4/3 five times 4/4, in females once 4/5, four times 5/5, and once each 5/6, 6/5, 5/7, 6/6 and 6/7, i.e. in males 3 sides with 3, 11 with 4, in females 1 with 4, 12 with 5, 5 with 6 and 2 with 7.

♂. Manubrium (M) of clasper slender, little widened in middle; digitoid (F) shorter than in *S. ivanovi*, only two-thirds the length of M, much broader at base, more curved, apex rounded; ventral arm of IX.st. narrower, the widened apex not angulate, the upper surface extending much farther distad than the lower, which is evenly and very moderately convex.

♀. VII.st. with a deep and very narrow subventral sinus, at some distance above which the margin bears a small indentation, no second sinus. Spermatheca much less broad than in *S. ivanovi*.

HABITAT. Eastern Kazakhstan, on *Microtus arvalis*.

Subsection A^4.—Ashkhabad, Djarkent and Ust-Urt. Rather large fleas. Labial palp with two segments, basal one short. Eye pigmented. Pronotum inclusive of comb one-fifth to one-quarter shorter than metanotum. Anterior section of mesosternosome divided by an internal band-like incrassation which extends from the lower end of the meral rod obliquely upwards and forwards to the anterior margin of the segment, the upperside of the band more or less well defined, whereas its underside gradually fades away (this band indicated in some of the preceding species). Transparent area of metepisternum longer than vertically broad. Oral margin less than twice as long as longest spine of genal comb. Antepygidials in males 4/4, in females 5/5, 6/5 and 6/6.

♂. Digitoid (F) of even width from near base to apex, which is rounded, longer than manubrium (M) of clasper.

♀. On VIII.t. above spiracle on each side about a dozen bristles, of which four or five posterior ones are stout and long.

9. ***Stenoponia vlasovi*** Ioff & Tiflov, 1934

Genal comb more acutely angulate than in other species. Metepimere with four rows of bristles, the anterior one usually incomplete. Segment V of all tarsi (both sexes) with eight spiniforms on the apical half of the ventral surface (probably variable). Spinelets on abdominal terga in the aggregate in male 23, in females 23–37.

♂. Manubrium of clasper slightly boot-shaped, proportions 30 : 7. Lower margin of ventral arm of IX.st. extending farther distad than upper margin. Proximal end of plate of phallosome round, not pointed, not curved up, as broad as the plate is in middle (pathological ?).

♀. VII.st. of abdomen with a broad shallow subventral sinus deepest below middle, the lobe above the sinus rounded, broad. Spermatheca much smaller than in *S. conspecta*.

HABITAT. Ashkhabad, from nests of *Spermophilopsis leptodactylus*.

In the Brit. Mus. (Nat. Hist.) collection, a male and female from Ashkhabad off *Rhombomys opimus*, presented by I. Ioff, 3 ♀ from Djarkent on *Meriones tamariscinus* (Rückbeil leg.).

10. **Stenoponia conspecta** Wagner, 1926

♂ *Stenoponia solitaria* Ioff & Tiflov, 1934, *Rev. Microbiol., Saratov*, **12**, pp. 201, 204, 206, fig. 10.

Metepimere with three rows of bristles, with one or two additional bristles between the rows. Segment V of all tarsi (both sexes) with three pairs of spiniforms ventrally on the apical area. Aggregate of abdominal spinelets in males 42 and 62, in females 50 and 60.

♂ Manubrium of clasper broadened, proportions 30 : 9–10 (in figure of *solitaria* a little broader). Digitoid (F) more curved than in *S. vlasovi*. Apical dilatation of IX.st. nearly as in *S. suknevi*, the upper margin extending farther distad than the ventral one, the extreme apex being dorsal.

♀. Subventral sinus of VII.st. deepest near its upper end, the lobe bounding it pointed. Tail of spermatheca broader than in *S. vlasovi*, snout more prominent, body almost as broad as long.

HABITAT. Djarkent and Ust-Urt, on *Rhombomys opimus*.

In Brit. Mus. (Nat. Hist.) 2 ♂ and 2 ♀ from Ust-Urt, presented by I. Ioff, and 1 ♂ from Djarkent.

Subsection A^5.—The single species, from Transbaikalia, differs so much from all the others that it might be advisable to place it in a separate genus. The male and female in the British Museum collection are defective, but show clearly some remarkable distinctions. The spines of the three combs much shorter than usual. Oral margin much longer than elsewhere, at least three times as long as the longest genal spine and nearly as long as the genal comb. Pronotum inclusive of comb shorter than metanotum.

11. **Stenoponia singularis** Ioff & Tiflov, 1934

A large species. Genal comb with 12–14 spines (Ioff & Tiflov), in our male genal comb 11/12, in female 13/13. Labial palp with one segment, which is longer than the fourth segment of the maxillary palp. First segment of the latter nearly one-half longer than II and III together, which are shorter than usual. Bristles of segment II of the antenna more than eight, especially long and numerous in female. Pronotum with two rows of bristles. Band-like incrassation dividing the anterior section of mesosternosome sharply defined, sclerotization of underside of band concentrated into a stripe extending downwards. Legs shorter than in any other species, particularly the tarsi, segment IV of hind tarsus being only one-eighth and V one-half longer than broad (pedicel excluded), III of hind tarsus in *S. vlasovi* and *S. conspecta* more than thrice as long as apically broad, in *S. singularis* the proportions are in male 20 : 10, in female 15 : 10. Antepygidials in our male 5/4, in female 6/7. Sensilium of male transverse, twice as broad as long, in female a little broader than long and *not* convex as in all other species of the genus. Abdominal spinelets in male too defective, in female on IV 8/11, V 5/10, VI 1/0.

♂. Digitoid (F) of clasper the shortest in *Stenoponia*, the apical third of its anterior margin slanting backwards, the tip of the digitoid obtusely pointed.

♀. VIII.t. above spiracle with nine or ten long stout, straight, bristles (besides many smaller ones) each side. Stylet with three long bristles at apex. Spermatheca stout, body one-third longer than broad.

HABITAT. Transbaikalia, on *Myotalpa* (now *Myospalax*) *myospalax*.

In Brit. Mus. (Nat. Hist.) one pair, presented by I. Ioff.

Section II.—The *Stenoponia tripectinata* complex, ranging from the Azores to Iraq. The following account is based on some 180 specimens, mounted in Canada balsam, and on the detailed information most kindly given me by Professor O. Theodor on the distribution, hosts and geophysical environment of the various *Stenoponia* occurring in Israel. The main distinction of the *tripectinata* complex from Section I is the gradual extension of the genal comb along the antennal fossa. A specimen which shows no indication of this development can always be recognized as belonging here by some other general somatic difference : the labial palp consists always of one segment ; the oral margin and first segment of the maxillary palp are of approximately equal length, and the anterior area of the mesosternosome is divided by a well-defined band-like sclerotization into an upper and a lower portion (nearly as in *S. singularis* Ioff & Tiflov).

Although the lower extreme of variation, without the second angle of the genal comb, is in several parts of the body very different from the upper extreme, with 4 spines along the antennal fossa and the eye consequently pushed upwards to the level of the oesophagus, a division of the available material into definite populations of closely related specimens leaves a residue of individuals which take an intermediate position. There is even some uncertainty about specimens taken off the same host-individual : it is reasonable to assume that these are members of one brood, i.e. brothers and sisters, but their morphological differences may be due to mixed parentage and certainty can only be attained by breeding. The knowledge of the genetics of at least one population of *Stenoponia* is greatly to be desired for another reason also. About a dozen females of various species (Nearctic, Asiatic and Mediterranean) contain one or two eggs (or remnants of eggs) each (Weiss, 1930, pl. 5), though never more than two ; they are so large that the two of them occupy about three-fifths of the lumen of the abdomen (Text-fig. 1). The sclerites of the abdominal segments are not broken up, nor are the intersegmental membranes enlarged, but there is a special adaptation in the eighth tergum for facilitating the passage of such a large egg, the posterior portion of the segment bearing a fold or slit running some distance forwards from the margin,

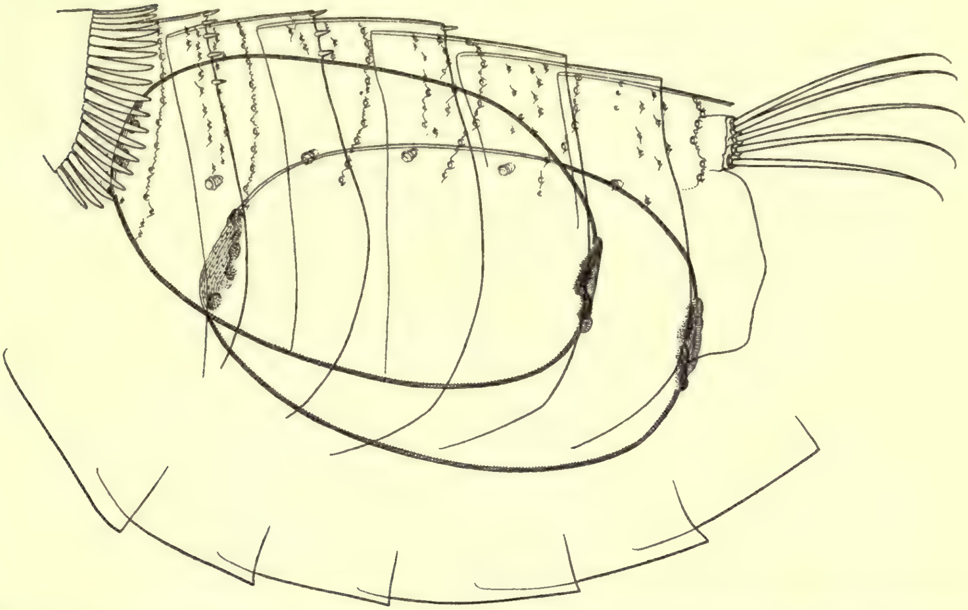


FIG. 1. *Stenoponia tripectinata acmaea* ssp. nov. Sketch of abdomen of female, El Mansuriva, Giza Province, Egypt, to show relative size of eggs.

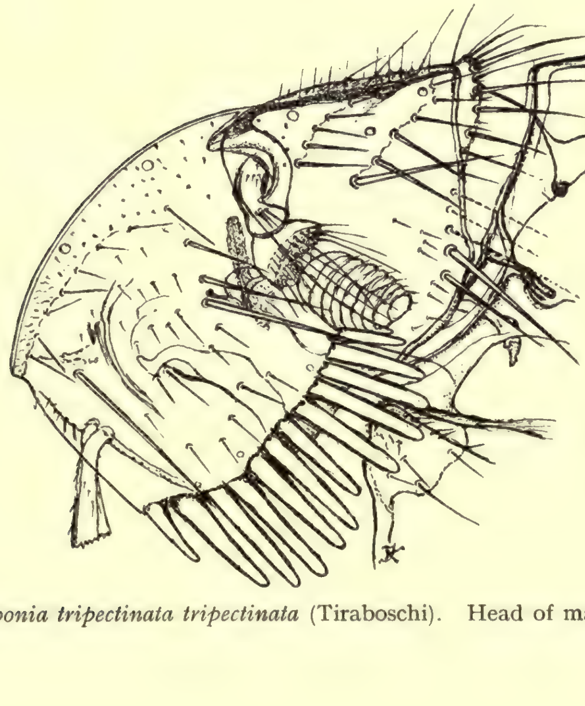


FIG. 2. *Stenoponia tripectinata tripectinata* (Tiraboschi). Head of male, Asuni, Sardinia.

which permits the segment to expand. This arrangement and its function would be worth study when breeding experiments are carried out.

Subsection B¹.—Above the point where the left and right oral margins meet there is a more or less distinctly projecting angle (oral angle) (Text-fig. 2; for lettering see Text-fig. 3, A); the distance (AC) of A from the base of the uppermost spine of the genal comb (C) is longer than the oral margin (CD). The total number of spinelets on abdominal terga II to VI, counting both sides together, is more than 30 in both sexes.

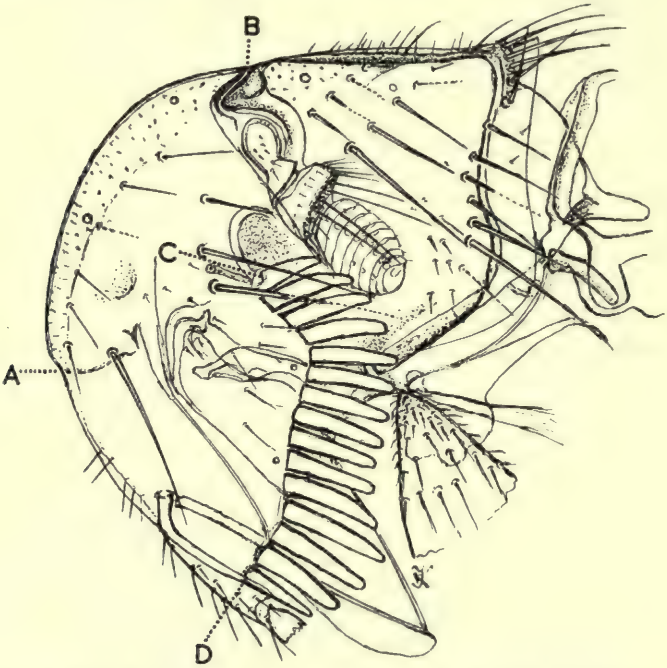
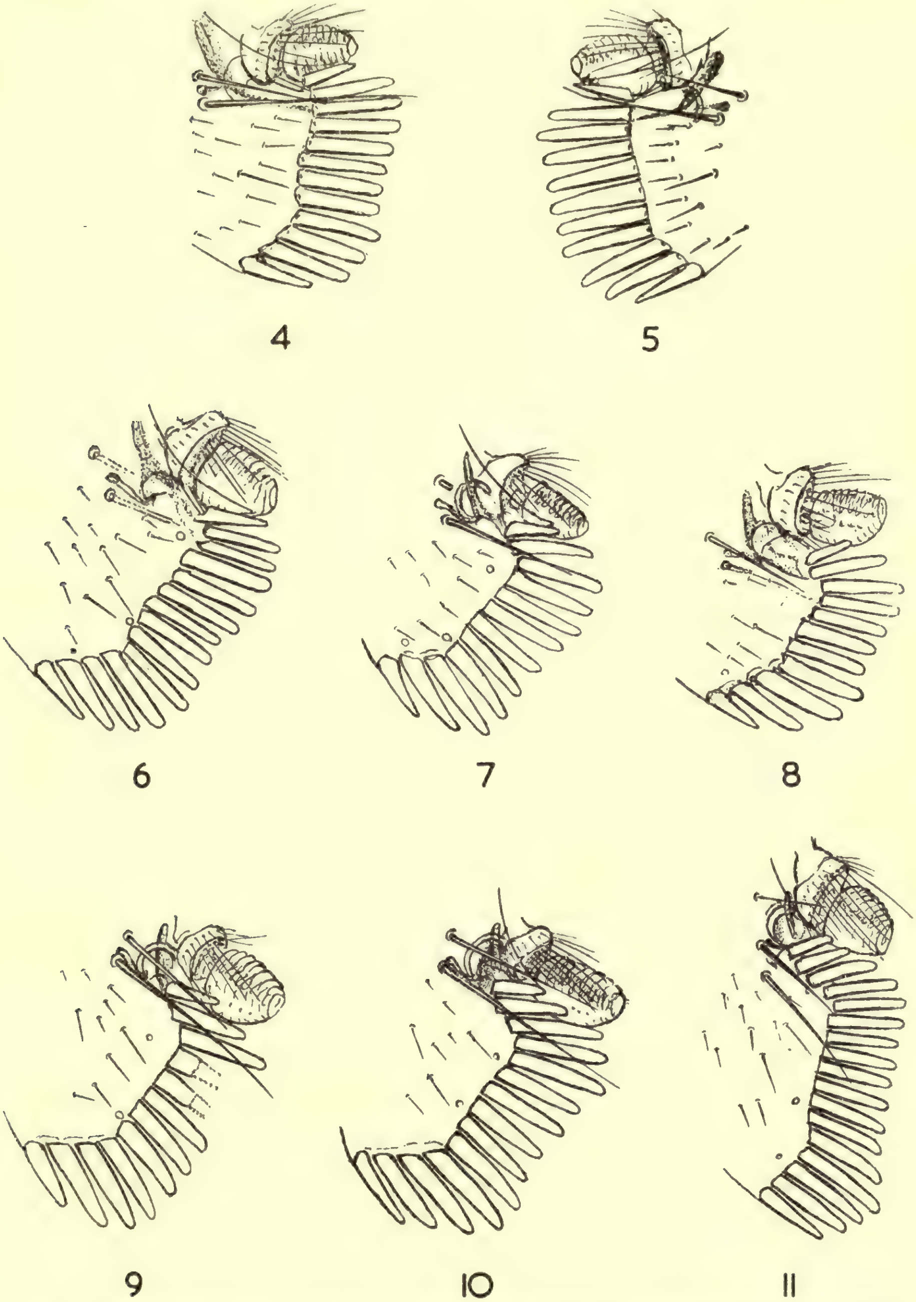


FIG. 3. *Stenoponia tripectinata acmaea* ssp. nov. Head of male paratype, El Mansuriya, Giza Province, Egypt.

Group b¹.—We unite here all the populations in which at most one spine is moved upward at the antennal fossa out of line with the preceding ones. Pronotal comb varying in the male from 35 to 40 spines (average 37) and abdominal comb from 32 to 38 spines (average 35); in the female the pronotal comb from 36 to 43 spines (average 37) and abdominal comb 35–41 (average 35).

1. ***Stenoponia tripectinata tripectinata*** Tiraboschi, 1902

The nomenclatorially typical (or nominate) subspecies is, in this case, also the most primitive one. AC longer than CD (Text-fig. 2). Variation of genal comb in



FIGS. 4–11. Genal comb in specimens of various subspecies of *Stenoponia tripectinata*. 4, 5. Left and right sides, respectively, of a male *S. t. tripectinata* from Hammam-Meskoutine, Algeria. 6. Female *S. t. tripectinata*, St. Michael, Azores. 7. Male holotype of *S. t. tenax* ssp. nov. 8. Male paratype of *S. t. megaera* ssp. nov. 9. Male paratype of *S. t. tingitana* ssp. nov. 10. Male paratype of *S. t. tingitana* ssp. nov. 11. Female paratype of *S. t. acmaea* ssp. nov.

male 11/12, 12/11 (Text-figs. 4, 5), 12/12, 12/13, 13/12, 13/13, in female 11/12, 12/11, 12/12, 12/13, 13/12, 13/13, 13/14, 14/13, 14/14 (Text-fig. 6); of antepygidial bristles in male 3/3, 3/4, 4/4, 4/5, in female 4/4, 5/4, 5/5. Total number of abdominal spinelets of each individual varying in male from 49 to 70 (average 59) and and in female from 42 to 67 (average 54). Number of small spiniforms on apical area of underside of tarsal segment V* varying in male on fore and mid tarsi from 6 to 9 (usually 6 or 7), on hind tarsus 4–6 (average 5·2), in female on fore and mid tarsi from 4 to 6 (usually 5), on hind tarsus from 2 to 5 (usually 4).

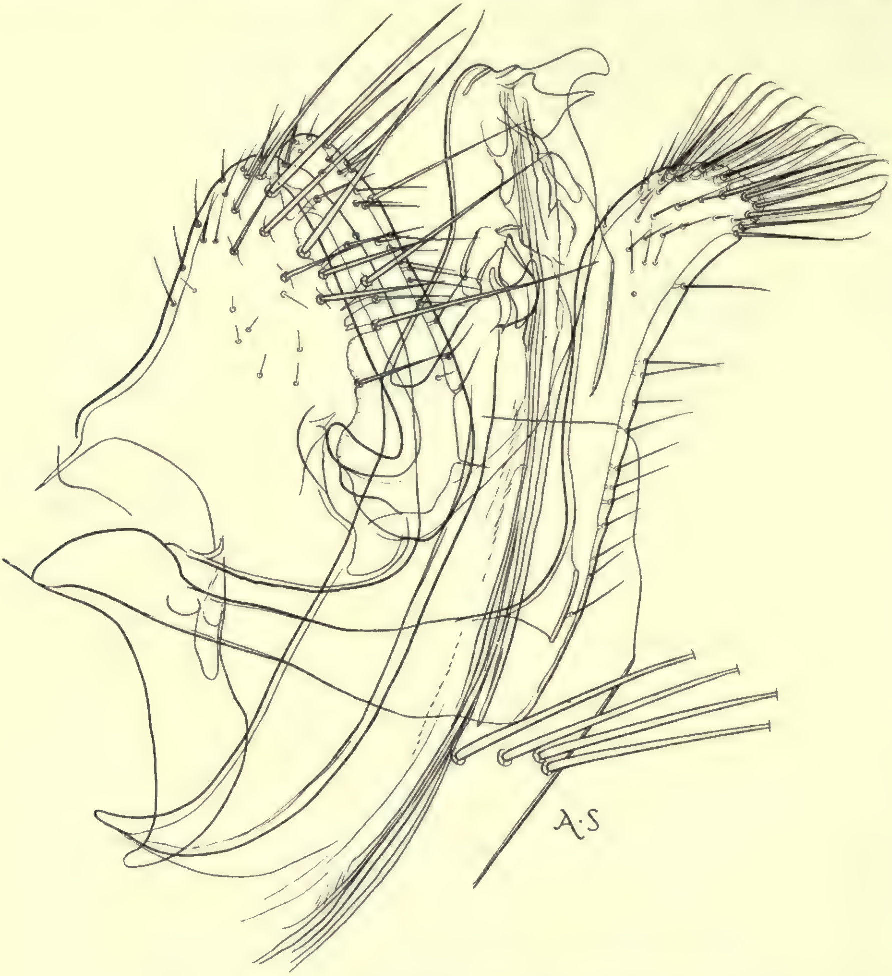


FIG. 12. *Stenoponia tripectinata tripectinata* (Tiraboschi). Terminalia of male, Asuni, Sardinia.

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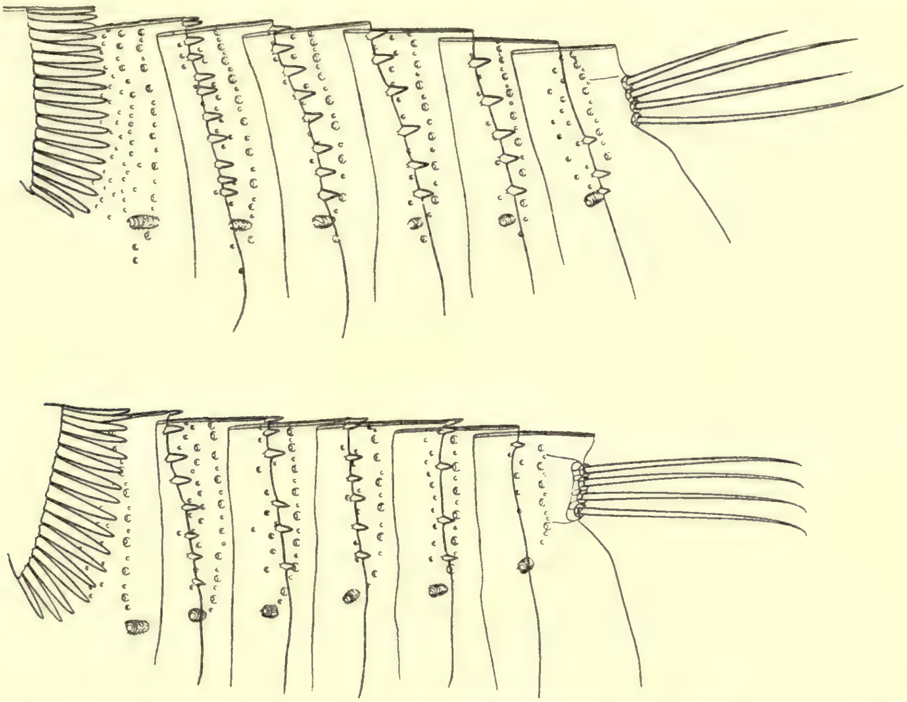
* The position of segment V on the slide is more often unfavourable than favourable for the exact counting of the spiniforms, the numbers of spiniforms are usually higher in males than in females and on fore and mid tarsi than on hind tarsus.

In the male (Text-figs. 12, 15–17) the widened apical portion of the morphologically ventral branch of IX.st. bent backwards, contrasting in direction with the narrow proximal portion of the branch and varying much in the degree of convexity of the upperside; the sclerite (crotchet plate) placed at the side of the terminal tube of the ejaculatory duct varies in size and shape in this and nearly all other populations of *tripectinata*, usually bearing a longish crotchet at the lower angle pointing obliquely down and sometimes a short one at the upper angle; subapical lobe of paramere more or less curved down at end. Abdominal tergum VI of male with one or more spinelets, most of which are lateral, situated above the spiracle of VII.t., which shines through VI (Text-fig. 13).



Figs. 13, 14. Combs of abdomen in males of *Stenoponia tripectinata* sspp. 13. *S. t. tripectinata* (Tiraboschi), Hammam-Meskoutine, Algeria. 14. *S. t. megaera* ssp. nov. holotype.

Habitat. St. Michael, Azores, 10th March, 1903, on *Mus* (probably " mouse "), W. R. Ogilvie-Grant, 4 ♀; Porto Santo, Madeira, T. V. Wollaston, 1 ♀; Asuni, Sardinia, 1910, on *Mus* (probably " Maus " = mouse) and under a stone, A. H. Krausse, 2 ♂, 3 ♀; Portici, S. Italy, 1917, on *Pitymys savii*, Dr. Nello Mori, 1 ♀; Malcoci, Romania, 19th December, 1906, on *Mus* (probably " mouse "), A. Rettig; Dobrogea, Romania, 1913, on *Apodemus sylvaticus*, W. Facius, 1 ♀; Adana, S. Anatolia, Turkey, January, 1907, on *Mus musculus*, and March 1907, on *Sorex* sp., B. H. Boyadjian, 7 ♂, 6 ♀; Khenchela, east end of Aurès Mts., Algeria, May

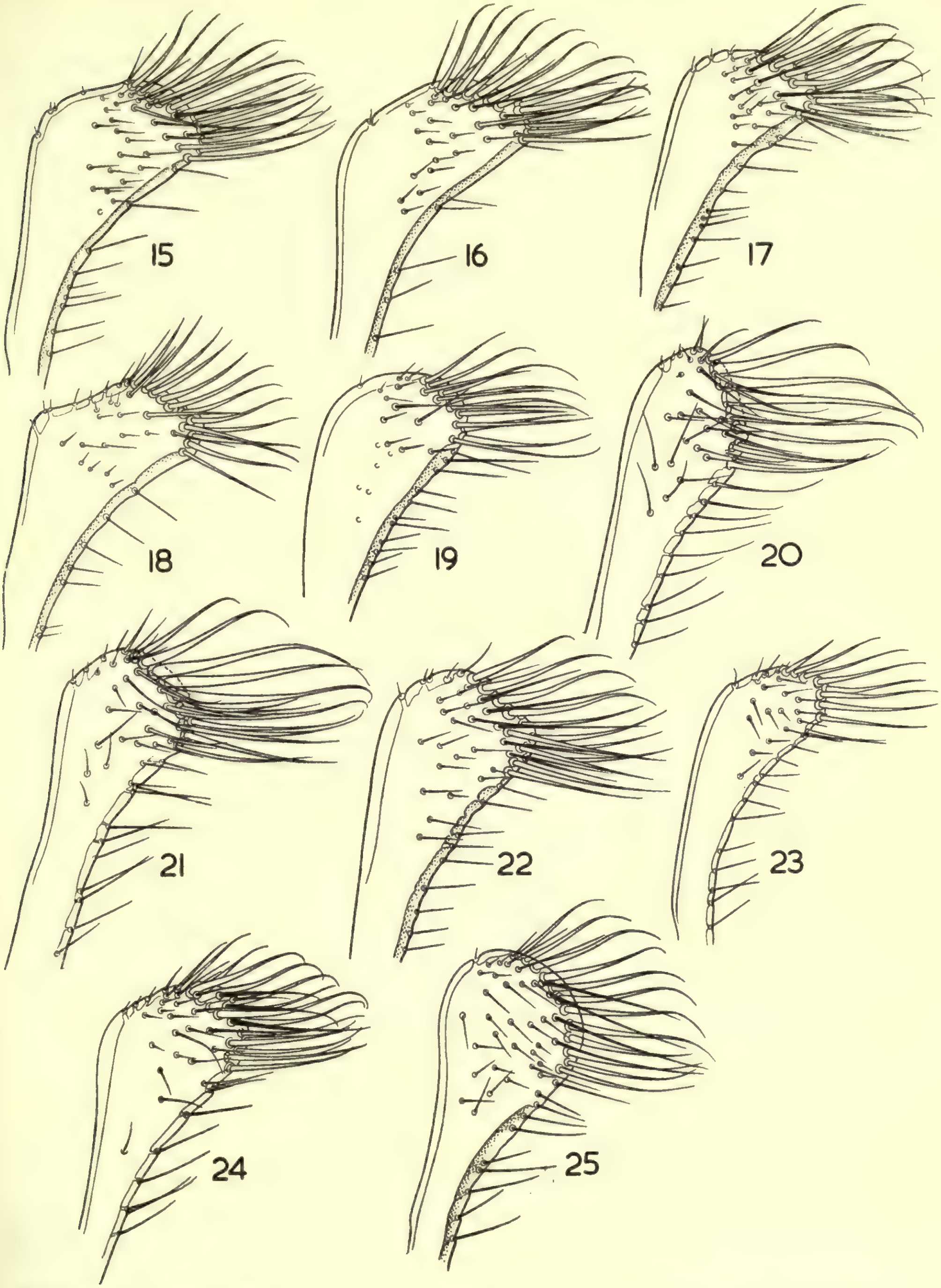
1912, on "*Mus algirus*" (error for *Mus musculus*, wild form), K. Jordan, 7 ♂, 3 ♀; Hammam Meskoutine, west of Guelma, Algeria, April 1914, on *Mus musculus* (wild form) and *Arvicanthis* (now *Lemniscomys*) *barbarus*, K. Jordan, 9 ♂, 10 ♀.

Considering that the extent of the variation of the topotypical population of this unstable flea is not known (the holotype, from Rome, having perished and there being in the British Museum collection only a single nearly topotypical female, from Portici), and that we have only one or a few specimens from six of the nine places mentioned above, splitting up Group b^1 into several subspecies would be premature. The analysis of the characters of the twenty-six males and twenty-nine females here recorded hints at the possibility that, on receipt of adequate collections from a greater number of localities in the large area in which this flea occurs, one or two new subspecies may become definable. The percentages of males with different numbers of antepygidial bristles (3, 4 or 5) suggest the following combinations of localities: (1) Azores, Madeira, Sardinia, Italy, Moldavia and other localities north of the Mediterranean Sea (in male 87% with 4 and 13% with 5, none with 3). (2) Algeria (Hammam Meskoutine and Khenchela) (in male 10% with 3 and 90% with 4, in female 100% with 5). (3) Adana (in male 50% with 3 and 50% with 4, in female 50% with 4 and 50% with 5; moreover, the extreme of dorsal convexity of the club-end of IX.st. of the male occurs (Text-fig. 17) in the Adana series.

Group b^2.—Two spines at the upper end of the genal comb are above the alignment of the comb. Three subspecies.

2. ***Stenoponia tripectinata tenax*** subsp. nov.

In our few specimens (three males, one female) the labial palp of the male is approximately one-fifth shorter than the first segment of the maxillary palp and one-eighth shorter than the oral margin, in the female one-fourth and one-fifth respectively, the proportion in numerals (labial palp = 1) in male 1 : 1·23 and 1 : 1·13, and in female 1 : 1·31 and 1 : 1·25. The width AC of the ante-antennal (frontal) section of the head varies from a little shorter to a little longer than one and a half times the oral margin (AD), the proportions being 1 : 1·48 in male and 1 : 1·55 in female; AD shorter than BD. Variation of genal comb in male 12/13 (holotype, Text-fig. 7), 13/12, 13/12, in the single female 13/13. Antepygidials in male 3/3, 3/3, 3/4, in female 5/5. Number of spines in pronotal comb of male 35–36, and in abdominal comb 30–33 (these numbers a little lower than in *S. t. tripectinata*); in female pronotal comb with 36, abdominal comb with 38. Total number of abdominal spinelets in the three males 50, 56 (average 54), in the female 54 (more than in the following subspecies); the spinelets on tergum V of the males number 6/6, 6/6 and 7/7, those on VI 1/3, 0/1 (lateral) and 1/0, in the female 5/6 on V. Spiniforms on apical area of underside of tarsal segment V more numerous than in *S. t. tripectinata*, in male on fore tarsus 8–13 (average 9·8), mid tarsus 10–12 (average 11·3), hind tarsus 6–8 (average 6·4), in female 7, 6 and 6.



FIGS. 15–25. Expanded apical part of ninth sternum in males of different subspecies of *Stenoponia tripectinata*. 15, 16. *S. t. tripectinata* (Tiraboschi), Hammam-Meskoutine, Algeria. 17. *S. t. tripectinata* (Tiraboschi), Adana, Anatolia, Turkey. 18. *S. t. tenax* ssp. nov., paratype. 19. *S. t. barcana* ssp. nov., holotype. 20. *S. t. tingitana* ssp. nov., holotype. 21. *S. t. tingitana* ssp. nov., paratype. 22. *S. t. insperata* (Weiss), Bir Mellah, Tunisia. 23. *S. t. separata* ssp. nov., holotype. 24. *S. t. thinophila* ssp. nov., holotype. 25. *S. t. acmaea* ssp. nov., paratype, El Mansuriya, Giza Province, Egypt.

IX.st. of male similar to that of *S. t. tripectinata*, broken off and lost in one specimen, longer and the dorsal side less incurved in the other paratype than in the holotype (Text-fig. 18); lower angle of crotchet-plate in two males with a fairly long crochet directed downwards, upper angle effaced, in third male the crotchet plate similar to that of Text-fig. 26 but smaller, the lower crotchet shorter and the upper one more distinct; subterminal lateral lobe of the paramere curved down at the end.

HABITAT. Guelt-es-Stel, roughly midway between Boghari and Djelfa, Algeria, 3 ♂ (including holotype) on 23rd April, 1912, and 1 ♀ on 21st May, 1912, off *Meriones shawi*, K. Jordan. This is the only place on the high plateau westward of Batna from which we have any fleas.

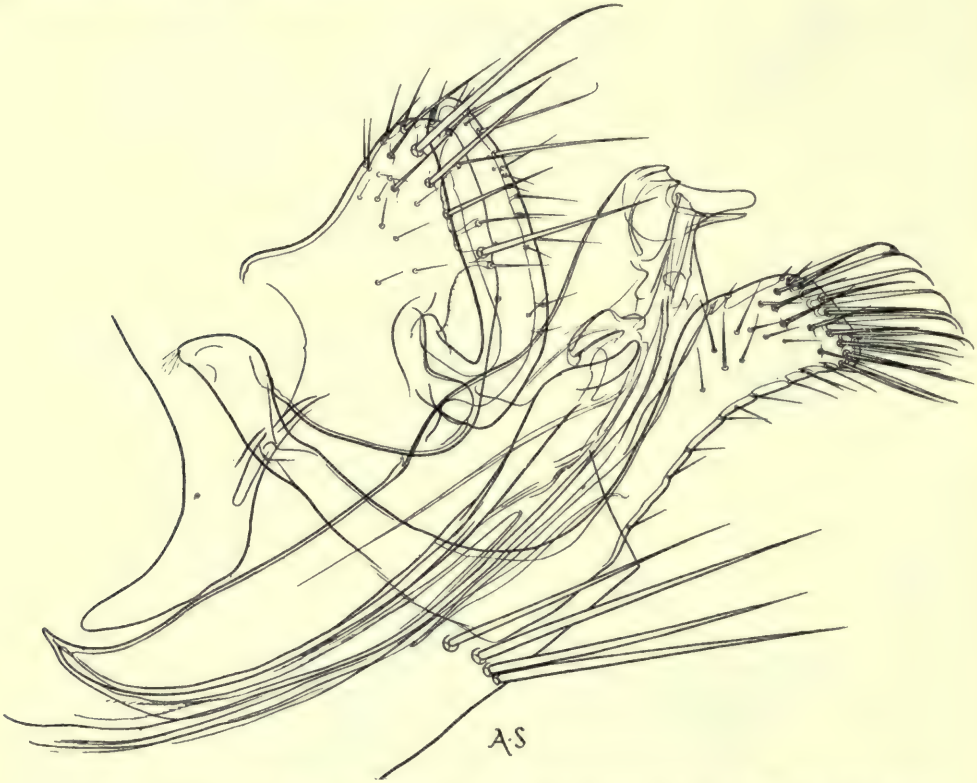


FIG. 26. Terminalia of male holotype of *Stenoponia tripectinata megaera* ssp. nov.

3. ***Stenoponia tripectinata megaera*** subsp. nov.

The definition of this subspecies is based on the specimens from Djebel Mourdjadjo, Oran. Labial palp longer than in *S. tripectinata tenax*, as long as the oral margin or a fraction shorter, taking its length as 1, the proportions with the first segment of the maxillary palp and with the oral margin are in the male 1 : 1·07 and 1 : 0·97, and in the female 1 : 1·04 and 1 : 1·01. Variation of the genal combs in the male 11/11 (Text-fig. 8), two with 12/12, two with 12/13, in female 11/12, four with

12/12, five with 13/13, two with 14/13. Width AC of frontal portion of head usually one-half longer than AD, the difference very rarely sinking to four-elevenths of AD. As in *S. tripectinata tenax*, AD is smaller than BC and is less than half BD. Antepygidials in our males 4/4, in eleven of the twelve mounted females (one defective)

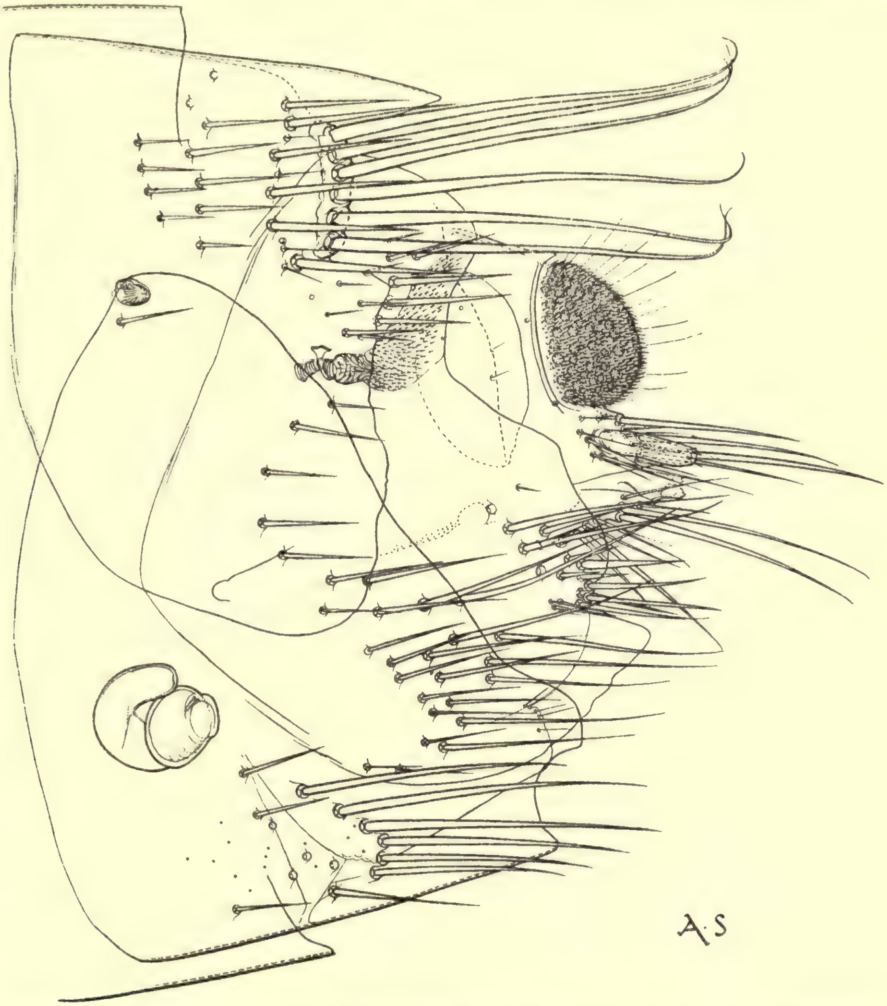


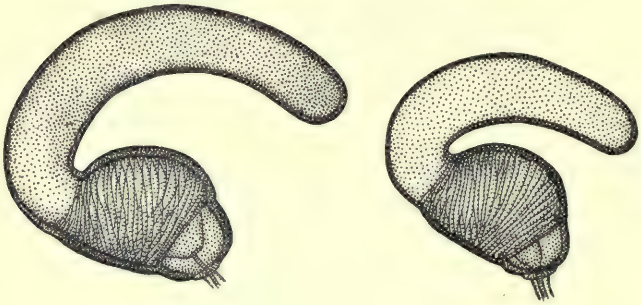
FIG. 27. Tip of abdomen of female of *Stenoponia tripectinata megaera* ssp. nov.

three with 5/5, one with 6/5, five with 6/6, one each with 7/6, 7/7 ; the prevalence of six and seven in a set of antepygidials (68% against 32% with five) characterizes this subspecies, the high numbers not occurring elsewhere in the *S. tripectinata* complex except in Morocco. Total numbers of abdominal spinelets varying in the males from 41 to 49 (average 47), in the females from 36 to 52 (average 43). Spinelets on V.t. in male 3/2, 4/4, 4/2 (Text-fig. 14), 4/4, 3/3 (average of totals for both sides 6·6, much lower than in S. *tripectinata tenax*, for which it is 12·7), on VI.t. three with 1/0, twelve with 1/1, in female spinelets on V.t. varying from 1/1 to 4/4 (average of totals 4·83). Spiniforms on apical area of underside of segment V of fore and mid tarsi 6–10 (average 8·5), on hind tarsus 5–6 (average 5·3), in female on fore and mid tarsi 6–8 (average 7), on hind tarsus 4–6 (average 5·6).

In the male (Text-fig. 12) the enlarged apical part of IX.st. dorsally more or less strongly convex, its apical margin slanting downwards and backwards, the most distal point being ventral or subventral; subterminal lobe of paramere not turned down at end, lower crotchet exceptionally long, straight, upper one short.

Female with tip of abdomen as in Text-fig. 26. Spermatheca (Text-figs. 27, 28) very variable in length of tail, distance between two parallel lines, one touching the tail at the anterior curve and the other at the tip, 16–22 units.

HABITAT. Djebel Mourdjadjo (behind Port Oran), Oran Province, Algeria, April 1913, on *Dipodillus campestris*, Alan Ruddle, 5 ♂ (including the holotype), 12 ♀.


28 29

FIGS. 28, 29. Spermatheca in female paratypes of *Stenoponia tripectinata megaera* ssp. nov.

Five males and three females, recently received from the Pasteur Institute at Casablanca and collected off *Dipodillus campestris* in the Nefifik Forest 33 km. NE. of Casablanca by Dr. J. Bruneau, are very similar to the Mourdjadjo population, but in all eight specimens the left genal comb has the same numer of spines as the right one, instead of three heads being asymmetrical in the combs as identity would demand. That raises the question whether the specimens with genal combs arranged symmetrically (like 11/11 and 12/12) are to be treated as taxonomically identical with the asymmetrical ones (11/12 and 12/11). The point will be dealt with in Subsection B^2, where asymmetry of this kind is conspicuous. The series from Morocco further differs in the antepygidials of the five males consisting of three sets of 3 and seven of 4, whereas in the Oran males they are all sets of 4; in the three Moroccan females they are 6/6, 6/5 and 5/4, none with 4 occurring in our twelve Oran females. Moreover, in this female with 5/4 there is on the left side of VI.t a distinct spinelet, the specimen being the only exception in our collection to the rule that in the S. *tripectinata* complex VI.t. has no spinelet in the female, and there is the additional difference that the average of spinelets on

V.t. is in the males 7·6 and in the females 6·0, as compared with the Oran averages of 6·6 in male and 4·8 in female ; variation in the individual totals of spinelets in the males is 40–52 (average 47), in females 36–49 (average 41, the high number in the aberrant third female). The distinctions are of no great weight and they may be negatived on receipt of more Moroccan material ; perhaps they indicate only that the eight specimens deviate partially from the Oran series, and for the time being, therefore, they may be referred to as Moroccan *megaera*.

4. ***Stenoponia tripectinata barcana*** subsp. nov.

Forehead shorter than in the three preceding subspecies, approaching in proportions the *Gerbillus*-flea of Subsection B^2. Frontal tubercle not quite effaced ; in male AC (measured both sides, 27/28 and 29/26) at most one-eighth longer than AD and AD a fifth longer than BC and less than two units longer than half BD ; CD equal to AD or one unit longer. Labial palp as in *S. tripectinata megaera*, somewhat longer than in *S. tripectinata tenax*. Genal combs in males 11/11 and 12/12, in both females 13/13. Antepygidials in both males 3/3, in females 4/4 and 5/5. Pronotum inclusive of comb as long as metanotum or one unit shorter. Totals of abdominal spinelets in males 32 and 44, in females 36 and 43, the averages (38 and 39·5) lower than in *tenax* and *megaera*. Males with spinelets on V.t. 3/2 and 5/3, on VI.t. 0/0 and 1/0. Spiniforms on apical area of underside of segment V of tarsi in male 9–10 on fore and mid tarsi, 6 on hind tarsus, in female 6 on fore tarsus, 5 and 6 on mid tarsus, 4 and 5 on hind tarsus.

Dilated apex of ventral arm of IX.st. of male (Text-fig. 19) rather strongly convex on the upperside, apical margin rounded, without angle, most distal point below middle, rather closely resembling Text-fig. 17. Crotchet-plate small, crotchets vestigial. Heel of manubrium of clasper gradually widened, less abruptly than in *megaera*.

The slanting upper margin of the lobe above the subventral sinus of VII.st. of the female somewhat abruptly incurved.

HABITAT. Barca (or Barka) peninsula, Cyrenaica, Libya, April 1946, on *Spalax ehrenbergi aegyptiacus*, Major W. Scott, two pairs (holotype a male).

> Group b^3.—Three or four spines of the genal comb placed at the margin of the antennal fossa, sometimes the base of the lowest of these spines not completely above the preceding one. The number of spines in the genal combs varies in the male from 11 to 14 (not 15) and in the female from 13 to 15 (but 15 occurring only on one side of very few specimens). Pale area of metepisternum always distinctly longer than vertically broad. AD smaller than half BD and equal to BC (± 1 or 2 units), AC one-sixth to a half longer than AD, usually one-third or a quarter.

5. ***Stenoponia tripectinata tingitana*** subsp. nov.

Labial palp less than two-thirds the length of oral margin. Genal comb in male 12/12 (Text-fig. 9), two with 13/14, 14/14 (Text-fig. 10), in female 14/13. Pronotum inclusive of comb a little shorter than metanotum (12 : 13 in male, 14 : 17 in female, ± 1). Spines in pronotal comb in male 33–36 (average 34·25), of abdominal comb 30–34 (average 31), in female 37 and 36. Variation of totals of abdominal spinelets in males 34, 50, 29, 36 (average 37·25), which is less than in the four preceding subspecies) ; in female 36. In male spinelets on V.t. 3/1, 4/2, 0/1, 1/1, total 13 (a low number), on VI.t. 1/0 and three with 0/0 ; in female on V.t. 2/3, on VI.t. 0/0. Antepygidials in males three with 3/3, one with 4/4, in female 5/5. Spiniforms on apical area of underside of segment V of tarsi in males 9–12 (usually 10, average 10·2) on fore and mid tarsi, on hind tarsus 6.

Dorsal surface of dilated apical portion of ventral arm of IX.st. of male extending farther distad than underside (Text-fig. 20), the greater portion of the long setae ventral and subventral, but in one of the four males (Text-fig. 21) the dorsal side much more convex than in the holotype (Text-fig. 20), the bristles more terminal but well below the level of the highest dorsal point. Crotchet-plate small, its margin incurved in the holotype and its lower angle with a short sharp crotchet, the outlines in the other males less distinct.

HABITAT. Rabelais, near Orléansville (close to the border of Oran province), Algeria, January 1930, in nest of *Meriones shawi*, H. Heim de Balzac, 4 ♂ (including holotype), 1 ♀.

6. ***Stenoponia tripectinata insperata*** Weiss, 1930 ; Wagner, 1932 ; Wagner & Wassilieff, 1933 ; *Stenopia tripectinata*, Jordan, 1931.

The late Monsieur Weiss assumed that the left and right sides of the flea he described were identical. Counting the left-side spines and spinelets, he simply doubled the numbers ; hence his statement that in the female—he described first the female and then the male, following the habit of the geneticists—the head bears a comb of 28 spines, and in the male of 26. In 1932 Wagner corrected some of Weiss's errors and added some details, but the head figured as that of a female is that of a male, and what he referred to as abdominal tergites IV and V were evidently V and VI. Fortunately Wagner sent us, in exchange, three males and four females of the series collected by Wassilieff. As Wagner used the small continental slides, the *Stenoponia*, like other mounted fleas received from him, were remounted at Tring and unfortunately suffered much in the process, only two of them being in fair order. Wagner's collection having been destroyed, no other specimens are available for an attempt to characterize *S. tripectinata insperata*.

Measurements of head : in male AD = BC or one unit shorter, AC approximately two-fifths longer than AD (on average as 24 : 17) ; CD nearly as long as AC (average of AD : CD as 17 : 22). Variation of genal comb in male 12/13, 13/12, 13/13 ; in female three with 14/14, one with 14/15, or in male 33% of combs with 12, 67% with 13 ; in female 87% with 14 and 13% with 15. Antepygidials in all three males 3/3 ; in all four females 4/4. As there is some uncertainty in the descriptions by Weiss (1930) and Wagner (1932) about the number of abdominal spinelets, particularly as regards terga IV to VI, we give here our counts in full for both sexes :

	Tergite				
	II	III	IV	V	VI
♂ .	7/7	6/7	4/5	3/3	0/1
	7/8	7/6	6/5	3/2	0/1
	6/7	7/6	6/5	4/2	0/1

	Tergite				
	II	III	IV	V	VI
♀ .	7/8	7/6	7/5	2/4	0/0
	8/6	7/5	6/6	5/2	0/0
	7/6	5/6	6/3	?/?	0/0
	9/5	5/6	6/6	2/1 ?	0/0

Totals in male: 44, 45, 44 (average 44·3), in female: 46, 46, ?, 40 ? (average 44 ?). Variation of length of pronotum plus comb in male 29–33 units (average 31), of metanotum 34–38 (average 36); in female pronotum plus comb 34–40 (average 38), metanotum 37–47 (average 42). Number of spines of pronotal comb varying in male from 33 to 35 (average 34), abdominal comb from 29 to 32 (average 31); in female pronotal comb from 34 to 36 (average 35), abdominal comb from 31 to 39 (average 35). Spiniforms on apical area of underside of tarsal segment V (countable accurately on only a few tarsi) in male 7–10 (average 8·2) on fore and mid tarsi, 6–7 (usually 6) on hind tarsi; in female 6 on mid tarsi, 6 (more rarely 5) on hind tarsi.

Terminalia of male: manubrium of clasper without heel, its length 22 units, digitoid (F) 27; dilated apex of ventral branch of IX.st. (Text-fig. 22) dorsally more convex than its ventral surface is concave, not subcircular in outline, its apical margin rounded, the long bristles below the highest point of upperside; crotchet-plate as broad as long, its outer margin incurved, at lower angle with sharply pointed broad short crotchet, upper end without crotchet; subapical lateral lobe of paramere rounded at apex.

HABITAT. Carthage area, Tunis, on *Gerbillus campestris*, Bir Mellah, Kairouan area, Tunisia, November 1931, on *Meriones shawi* (in enormous quantity in the nest according to Wagner & Wassilieff, 1933) and *Dipodillus campestris*; in British Museum (Nat. History) 3 ♂, 4 ♀.

We interpolate here, as *S. tripectinata* subsp., a pair from Biskra, South Algeria, taken by J. Steinbach on *Meriones shawi* in February–March 1908. The male is larger than the female and the genal combs are in the male 14/14 and in the female 13/13, from which it might be reasonable to conclude that the number of genal spines depends on the size of the specimen, which is contradicted by many instances. A pair of the next subspecies, for example, stated by the collector to have been collected on *Arvicola*, differ in the spines of the genal comb being in the male 14/14 and in the female 13/14, but the male is the smaller of the two, AD being 19 units long in the male and 23 in the female, the pronotum plus comb 34 in the male and 38 in the female.

Antepygidials of Biskra male 3/3, of the female 5/4. Spines in pronotal comb of male 38, of abdominal comb 38, in female 36 and 37 respectively. Length of pronotum plus comb in male 40 units, of metanotum 44, in female 36 and 41. Spinelets on abdominal terga in male on II 8/8, III 8/7, IV 6/6, V 6/4, VI 0/1; in female on II 7/7, III 8/7, IV 6/7, V 1/1, VI 0/0; totals 54 in male, 44 in female. Spiniforms on underside of tarsal segment V in male 11 on mid tarsus, in female 6 on fore tarsus and 5 on hind tarsus (the other tarsi imperfect or in a bad position).

Terminalia of male nearly as in *S. t. insperata*, dilated apex of IX.st. ventrally more rounded and expanded, but still much less convex than on dorsal side; crotchets indicated.

7. ***Stenoponia tripectinata medialis*** subsp. nov.

According to the accounts of *S. t. insperata* given by Weiss, Wagner & Wassilieff, and the study of our seven specimens of that subspecies, the fleas we have from Rehoboth in Israel differ markedly from *insperata* in the genal combs, the antepygidials, abdominal spinelets and, in the female, the tarsal spiniforms.

Of our six males of *medialis*, two have 13/13 spines in the genal combs, one has 13/14 and three have 14/14, none having 12 spines; put in percentages, there are 42% with 13 spines and 58% with 14. Of the five females, one has 13/13 spines, one 13/14, two 14/14 and one 14/15; in percentages 30% with 13 spines, 60% with 14 and 10% with 15. Instead of the three antepygidials found in the male of *S. t. insperata* and four in the female of that subspecies, there are in the six males of *S. t. medialis* four with 3/3, one with 3/4 and one 4/3, and in the seven females (including two of which Professor O. Theodor has given me the details) three with 4/4 bristles, two with 5/4 and two with 5/5, or 57% of sets of antepygidial bristles in the female with four bristles and 43% with five. Aggregate of the spinelets on abdominal terga II to VI of each male individual 43, 37, 39, 39, 35, 37 (average 38), in female 31, 32, 38, 37, 25, 18, 34 (average 31); the aggregate of 18 is exceptionally small and points to Subsection B², where such low averages for the spinelets are normal. The variation in the number of spinelets on the homologous terga is as follows in the six males: on II from 12 to 14, total number 80, average 13·3, on III from 11 to 12, total 57, average 9·5, on IV from 8 to 10, total 51, average 8·5, on V from 4 to 7, total 29, average 4·8, on VI 0–2, total 4, average 0·67; in the seven females on II from 7 to 15, total 84, average 12, on III from 7 to 14, total 71, average 10·1, on IV from 4 to 10, total 47, average 6·8, on V from 0 to 5, total 17, average 2·4, on VI none. Spinelets of each of the six males: on V 4/2, 2/2, 2/1, 2/3, 2/2, 3/4, on VI 1/1, 1/0, 0/0, 0/0, 1/0; in the seven females on V 0/2, 1/0, 3/1, 0/1, 1/3, 0/0, 3/2, on VI 0/0 in all specimens. It should be noted that one female has no spinelets on V and that in three others one side is devoid of them, and further that the average of spinelets on segment V of the seven specimens is only one-fifth the corresponding average for segment II. The number of spines in the pronotal comb varies in the male from 31 to 34 (average 32·7) and in the female from 31 to 36 (average 32); variation in the number of spines in the abdominal comb in the male is from 31 to 36 (average 32·3), and in the female from 31 to 39 (average 34·4). Length of pronotum plus comb in male 32–36 units (average 34); length of metanotum 38–42 (average 41); in female pronotum inclusive of comb 36–39 units (average 37·5), metanotum 45–49 (average 46·8). Number of spiniforms on underside of tarsal segment V in male 8–12 (usually more than 10) on fore and mid tarsi, 5–9 on hind tarsus (usually 6, rarely 5), in female fore and mid tarsi with 6 (rarely 7), hind tarsus usually with 4 and less often 5 (there are also 4 spiniforms in *S. t. tripectinata*).

Terminalia of male similar to those of *S. t. insperata*, widened apical portion of lower arm of IX.st. dorsally convex as in *insperata* but variable, in one male slenderer than in Text-fig. 17, broadest in male off *Arvicola* ; crotchet shorter than outer margin of crotchet-plate.

HABITAT. Rehoboth, near Jaffa, Israel, 8th February, 1914 on *Meriones shawi tristrami*, and 1st January, 1914 on "*Arvicola*", J. Aharoni, 6 ♂, 5 ♀ ; holotype a male with 14/14 spines in the genal comb, off *Meriones*.

Two females (one of them at Tring) from Hadassim, Israel, are referred here provisionally. Their genal combs are of 13/13 and 14/14 spines, their antepygidial bristles 3/3 and 4/4, and the totals of their abdominal spinelets 33 and 26.

8. ***Stenoponia tripectinata spinellosa*** subsp. nov.

In four males and three females the variations of the proportions of the head are as follows : in male AD 18–21 units (average 19·5), AC 23–25 (average 24), BC 17–21 (average 19·3), CD 22–23 (average 22·8), BD 43–45 (average 44·3) ; in female AD 22–23 (average 22·3), AC 26–28 (average 27), BC 23, CD 27–28 (average 27·7), BD 52. Length of pronotum plus comb in male 30–33 (average 31·5), of metanotum 36–40 (average 38) ; in female pronotum plus comb 39–42 (average 40·3), metanotum 45–48 (average 46·9). Spines of pronotal comb in male 34–37 (average 35·8), in female 38 ; spines of abdominal comb in male 31–36 (average 34·3), in female 34–38 (average 36) ; spiniforms on underside of tarsal segment V in male 8 (rarely 7) on fore and mid tarsi, 6–8 (usually 8) on hind tarsus ; in female 6 (more rarely 7) on fore and mid tarsi, 6 (rarely 5) on hind tarsus.

Inclusive of information received from Professor O. Theodor on additional specimens (five males, seven females) the following account is based on nine males, ten females from near the foot of Mount Carmel. One male has 12/11 spines in the genal combs of the two sides, three 12/12, two 13/12, two 13/13 and one 12/14 ; in percentages 5·5% of combs have 11 spines, 56% have 12, 33% 13 and 5·5% 14 spines ; in the female sex one has 12/12 spines, one 12/13, seven 13/13 and one 14/13 ; expressed in percentages 15% of combs contain 12 spines, 80% have 13 and 5% 14 spines. The difference of 2 spines in the left and right genal combs of one of the specimens is remarkable ; this condition occurs very rarely. The number of antepygidials does not vary individually, being 3/3 bristles in the male and 4/4 in the female. The spinelets of abdominal terga II to V are surprisingly numerous, the aggregate on each of the nine males being 49, 57, 45, 47, 52, 57, 55, 64, 59 (average 54), in the ten females 51, 46, 50, 63, 54, 48, 68, 48, 64, 59 (average 55) ; similar high averages occur in the Algerian populations of *S. t. tripectinata* but the sets of antepygidial bristles in these latter nearly all contain four bristles in the male (93% with four, only 7% with three) and all contain five bristles in the female.

Some other points of interest become very obvious when the totals of spinelets on corresponding segments are compared with each other and with the numbers in preceding populations : the variation on II in the nine males extends from 15 to 17 (total 150 ; average 16·7), on III from 11 to 17 (total 132 ; average 14·7), on IV from 11 to 14 (total 114 ; average 12·7), on V from 7 to 11 (total 77 ; average 8·6), on VI from 0 to 1 (total 3; average 0·3); in the ten females the variation on II is from 15 to 21 (total 183; average 18·3), on III from 14 to 19 (total 160; average 16), on IV from 10 to 17 (total 140; average 14), on V from 5 to 11 (total 69; average 6·9), on VI always 0. The female as well as the male has spinelets on both sides of tergum V, and only three of the males have only one spinelet on one side of this tergum (and six or more on the other). A comparison of the averages of the numbers of spinelets on the corresponding terga in *S. t. medialis* and *S. t. spinellosa* is given below:

		Tergite						Tergite				
		II	III	IV	V	VI		II	III	IV	V	VI
medialis .	♂ .	13·3	9·5	8·5	4·8	0·67	♀ .	12	10·1	6·8	2·4	0
spinellosa .	♂ .	16·7	14·7	12·7	8·6	0·3	♀ .	18·3	16	14	6·9	0

Terminalia of male similar to those of *S. t. medialis*, but the dilated apex of the ventral arm of IX.st. a little more round-convex distally, slightly approaching symmetry.

Habitat. Mishmar Haemek (or Mishmar Ha'emeq, about 7 km. from the foot of Mt. Carmel), Israel, 7th December, 1952, on *Meriones shawi tristrami* (M. Costa leg.), a series in the collection of the Department of Parasitology, Hebrew University of Jerusalem; holotype and some paratypes in the British Museum (Natural History). Holotype a male with 12 genal spines each side, 51 abdominal spinelets and no spinelet on tergum VI. In the collection of the University of Jerusalem there are two females from near Jerusalem (Aqua Bella) which evidently belong here, but the total of abdominal spinelets in one of them is only 41 and there is only 1 spinelet on tergum V.

9. ***Stenoponia tripectinata irakana*** subsp. nov.

The three specimens (one male, two females) we possess are characterized by the number of spines in all six genal combs being 14, and the counts of abdominal spinelets 46 in the male and 52 and 56 in the females.

Proportions of head: in both sexes AD shorter than AC, than CD and than half BD. Number of spines in pronotal comb 36 in the male, 38 and 37 in the females; in the abdominal comb 35 in the male, 35 and 38 in the females. Length of pronotum, including comb, 37 units in male, 38 and 39 in the females, of mesonotum 45 in the male, 44 and 47 in the females, of metanotum 44 in the male, 46 and 49 in the females, of abdominal tergum I inclusive of comb 35 in male, 35 and 39 in females. Antepygidials as in *S. t. spinellosa*, 3/3 in male, 4/4 in both females. Spiniforms on ventral surface of tarsal segment V in male 11–13 on fore tarsus, 12 on mid tarsus, 7 on hind tarsus; females with 6 and 7 on fore and mid tarsi and 6 on hind tarsus.

Apex of ventral arm of st.IX of male almost symmetrical, proximally of the broadest point more incurved ventrally than dorsally.

HABITAT. Karradit Marion, Baghdad, Iraq, 28th January, 1953, 1 ♂ (type) from *Mus musculus praetextus* and New Baghdad Race Track, Baghdad, Iraq, 5th February, 1953, 1 ♀ from *Gerbillus lofthusi*, C. A. Hubbard ; Haur al Hasa, west bank of Euphrates SW. of Faluja, Iraq, from *Jaculus jaculus lofthusi*, December 1954, 1 ♀, D. L. Harrison.

10. ***Stenoponia tripectinata separata*** subsp. nov.

Particularly distinguished by the narrowness of the club of IX.st. of the male. Proportions of head in male : AD 19, AC 23, BC 19, CD 22, BD 42 ; in female : AD 23, AC 29, BC 21, CD 30, BD 53. Number of spines in the genal comb in males 12/13 and 13/13 (type), in the only female 14/15. Antepygidials 3/3 in both males, 4/4 in the female. Number of spinelets on abdominal terga of male holotype 7/7 on II, 6/6 on III, 6/5 on IV, 3/3 on V, none on VI (total 43), in the second male 7/7 on II, 6/6 on III, 5/6 on IV, 4/4 on V, none on VI (total 45) ; female with 8/9 on II, 8/8 on III, 6/6 on IV, 3/4 on V, none on VI (total 52). Number of spines in pronotal comb of both the male and the female from the Mersa Matruh area 36, of the abdominal comb 32 in the male and 36 in the female ; second male with 38 spines in the pronotal comb and 35 in the abdominal one. Length of pronotum plus comb in the male from the Mersa Matruh area 33 units, in the female 40, mesonotum 38 in the male and 48 in the female, metanotum 37 in the male and 45 in the female, abdominal tergum I plus comb 29 in the male and 37 in the female ; corresponding measurements in the second male 35, 40, 40 and 32. Number of spiniforms on tarsal segment V of the male holotype 12 on fore tarsus, 10 (?) on mid tarsus, 7 on hind tarsus ; female with 6, 6/6 and 6 respectively ; all legs of second male defective.

Club of ventral arm of IX.st. of male similar to that of *S. t. barcana* but narrower (Text-fig. 23), very little broader in second male than in holotype ; length of digitoid (F) 29 units, of manubrium (M) 26, and of ventral margin of VIII sternum from the point of division into left and right lateral lobes proximad to the pit of the nearest long bristle 14 units, i.e. longer than in the subspecies following.

HABITAT. Thirty-seven miles west of Mersa Matruh, Western Desert Province, Egypt, 13th January, 1933, 1 ♂ (holotype), 1 ♀, and 19 miles east of Sidi Barrani, Western Desert Province, 1 ♂. Both the localities are on the north-west coast of Egypt and the second locality is about 52 miles from Matruh. As the specimens were collected from burrows of undetermined rodents, by H. Hoogstraal, it seems possible that the rodent may have been *Spalax ehrenbergi*, which occurs from Cyrenaica (eastern Libya) through Lower Egypt to Israel and Syria.*

Subsection B^2.—Head (Fig. 3) anteriorly much more rounded than in Subsection B^1, the frontal angle vestigial or effaced. Oral margin, AD, as long as or longer than AC, rarely one or two units shorter than AC†. The average of the total number of spinelets on abdominal terga II to V of the specimens of a subspecies is 30 or less; VI without spinelets in either sex. Club of IX.st. of male almost symmetrical as in *S. t. insperata* and *S. t. irakana*. Three subspecies.

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* Mr. Hoogstraal kindly tells us that he thinks the very characteristic burrows of *Spalax* would have been recognized and that it is more probable that the owners of the burrows were either *Meriones shawi* or *Psammomys obesus*.

† It is sometimes necessary to measure both sides of the head and take the average of these measurements as the true length.

Group b⁴.—Number of spines of the genal comb in the majority of specimens of both sexes 14, none of either sex with 16. Abdominal tergum V in both sexes with one or two spinelets on at least one side. Average totals of spinelets in our two males 29, in three females 29·3; average number of spinelets on IV in male 6, in female 6·7.

11. ***Stenoponia tripectinata blanda*** subsp. nov.

Proportions of head in male holotype (those for male paratype in brackets): AD 18 units (21), AC 19 (20), BC 17 (19), CD 23 (24), BD 40 (43). In three females AD 20, 21 and 22 respectively, AC 21, 21 and 22, BC 19, 20 and 21, CD 23, 25 and 26, BD 43, 45 and 46. Spinelets on abdominal terga in holotype male 7/6 on II, 6/5 on III, 4/4 on IV, 0/1 on V, total 33; in second male 5/6, 4/4, 2/2 and 1/1, total 25; average total number of spinelets for the two males 29. Spinelets in the three females 6/5, 5/6 and 6/6 on II, 4/4, 4/5 and 7/5 on III, 2/3, 3/3 and 5/4 on IV, 0/1, 1/1 and 0/2 on V, totals for the three individuals 25, 28 and 35 (average 29·3). The aggregate number of spinelets on tergum IV of the two males is 12 (average 6) and in the three females the aggregate is 20 (average 6·7), while in the two subspecies which follow the average number of spinelets on IV is half (male) or less than half (female) the number found in *blanda*. Spines of pronotal comb of male 15/15 and 17/17, in females 18/18, 18/17 and 17/19. Dorsal length in males of pronotum plus comb 28 and 30, of mesonotum 34 and 36, of metanotum 36 in both, of tergum I of abdomen including comb 28 and 30; corresponding figures for the three females are pronotum with comb 33, 32 and 30, mesonotum 41, 40 and 35, metanotum 42, 40 and 37, tergum I with comb 35, 35 and 34. Number of spiniforms on apical area of underside of tarsal segment V in males ?/? and 8/9 on fore tarsus, 7/7 and ?/? on mid tarsus, 6/6 and 6/6 on hind tarsus; in females ?/?, 6/7 and ?/6 on fore tarsus, 7/6, ?/6 and 6/6 on mid tarsus, 6/6, 6/? and 6/6 on hind tarsus.

The length of the convex dorsal surface of the club of IX.st. of male (measured from upper long apical bristle forward) is nearly equal to width of club and the concave ventral area extends to the first long ventral bristle of the apical row.

HABITAT. Bir Bosslanga, near Salum (or Sollum), Libyan Plateau, Western Desert Province, Egypt, about 500 ft., from nests of *Gerbillus*, 25th October, 1953, H. Hoogstraal, 1 ♂ (the holotype) and 3 ♀; 12 miles south of Sidi Barrani, Western Desert Province, from *Gerbillus gerbillus*, 23rd April, 1954, H. Hoogstraal, 1 ♂.

The form is morphologically intermediate between the preceding subspecies and the following ones.

Group b⁵.—The number of spines in the genal combs is 15 or 16 in the great majority of males, in females it is 15, 16 or (rarely) 17. The total number of spinelets on the abdominal terga varies in the thirty-five males seen from 9 to 24 (average 15), in the fifty-one females from 11 to 27 (average

20·5). There are two subspecies, possibly more. We have five males and six females from Aïn Séfra, South-west Oran near the Moroccan border, sixteen males and twenty-five females from Egypt (mostly from Giza Province and the adjacent portion of Beheira Province, but also some from north of Shirbin) and Israel (two pairs from near Tel-Aviv plus detailed information of twelve males and sixteen females supplied by Prof. Theodor). The *Stenoponia* in question are almost confined to *Gerbillus* and *Jaculus*, which are partial to sand-dunes; it is a reasonable assumption that *Stenoponia* will be found in suitable places everywhere from Morocco (inclusive) to Egypt as well as in the Arab countries of the Middle East.

12. ***Stenoponia tripectinata thinophila*** subsp. nov.

Variation of proportions of head in five males: AD 22–26 units (average 22·8), AC 20–23 (average 21·6), BC 18–21 (average 19·0), CD 24–29 (average 26·0), BD 45–50 (average 46·2); in six females AD 23–26 (average 24·2), AC 23–26 (average 24·3), BC 20–22 (average 21·4), CD 28–35 (average 30·8), BD 52–56 (average 54·0). Variation in the left and right sides of the genal comb in males: 14/13, 14/14, 14/14, 15/14, 16/15; in females 15/15, 15/16, 15/16, 16/16, 16/16, 16/16; in the males 10% of combs with 13 spines, 60% with 14, 20% with 15 and 10% with 16; in the female 33·3% with 15 spines and 66·7% with 16; the high proportion of genal combs with 14 spines in the male and 16 in the female is characteristic of this subspecies. Antepygidial bristles: four males with 3/3 and one with 4/4 (i.e. 80% with three bristles and 20% with four), two females with 4/4 and four with 5/5 (i.e. 33·3% with four and 66·7% with five). As the abdominal spinelets are of special interest in the study of the evolution of the *S. tripectinata* complex and our eleven specimens are a mere sample from an isolated locality in western Algeria, the details of the variation of the spinelets are given here as a possible help for the future student of these fleas who may have abundant material from the areas further west and east which are not at present accessible to the naturalist.

	Tergite				
	II	III	IV	V	Total
♂ .	5/6	3/2	2/1	1/0	. 20
	4/5	4/4	1/1	0/0	. 19
	2/5	3/3	2/1	0/0	. 16
	5/5	2/2	1/1	0/0	. 16
	5/4	1/1	1/1	0/0	. 13

	Tergite				
	II	III	IV	V	Total
♀ .	4/5	3/2	2/2	1/1	. 20
	3/6	1/3	2/3	1/0	. 19
	3/3	1/1	1/0	0/0	. 9
	5/4	2/2	1/1	0/0	. 15
	5/7	2/6*	2/4	0/1	. 27
	5/4	2/2	1/2	1/2	. 19

Average of individual totals of spinelets in male 16·6, in female 18·1. In the five males total of spinelets on II 46 (average 9·2), on III 25 (average 5·0), on IV 12

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* The great difference in the number of spinelets on the left and right sides of this specimen is partly due to unsatisfactory mounting, the sides not covering each other symmetrically so that the two spiracles of a segment are as far apart vertically as double the interspace between two long bristles of the posterior row.

(average 2·4), on V 1 (average 0·2); in six females 54 on II (average 9·0), 27 on III (average 4·5), 21 on IV (average 3·5), 7 on V (average 1·2). The present population differs from all others in the fact that tergum V bears spinelets in four out of six females, whereas in the male only one specimen has a spinelet on V. In the two following populations (thirty males and forty-five females in all) one male has spinelets on V and all females are without them on this tergum.

Number of spines in pronotal and abdominal combs in individual males 39 and 38, 33 and 34, 34 and 30, 35 and 35, 35 and 36; in females 37 and 39, 38 and 43, 37 and 42, 39 and 41, 38 and 42, 35 and 35; averages in male 35·6 and 34·6, in female 34·4 and 37·0. The fact that in the female the number of spines in the abdominal comb is nearly always greater than the number in the pronotal comb is the opposite of what obtains in the populations of Group b^5 from Egypt and Israel.

Lengths of various segments are as follows:

	Pronotum plus comb	Mesonotum	Metanotum	Abdominal t.I plus comb
	Males			
	36	39	41	34
	30	36	35	29
	29	33	33	28
	30	36	37	32
	29	33	36	30
Average .	30·8	35·4	36·4	30·6
	Females			
	38	45	43	39
	37	42	45	40
	40	47	48	41
	39	43	43	40
	37	45	42	37
	36	43	42	38
Average .	37·8	43·6	43·8	39·2

Number of spiniforms on apical area of underside of tarsal segment V of male on the two sides ?/9, ?/8, ?/9, 14/?, 8/? on the fore tarsus, ?/9, 9/?, 8/?, ?/?, 8/7 on the mid tarsus and 7/7, ?/?, ?/7, 8/8, 6/? on hind tarsus; females with ?/8, 7/8, 7/7, 8/?, 7/7 and ?/? on fore tarsus, ?/7, 7/?, 7/?, 8/7, 7/? and 9/9 on mid tarsus and ?/7, 6/?, 6/6, ?/6 and ?/5 on hind tarsus.

The convex dorsal surface of the club of IX.st. of the male longer than in the next subspecies and the underside, from the long apical bristles forward, usually a little more distinctly convex than in Text-fig. 24, taken from the type.

HABITAT. Aïn-Séfra, south-western portion of Province of Oran, Algeria, 4th–7th May, 1913, from *Gerbillus pyramidum hirtipes*, Dunn leg. (on ornithological expedition of W. Rothschild and E. Hartert to western Algeria), 5 ♂ and 6 ♀. Holotype a male with 14/14 genal spines and 2/1 spinelets on tergum IV.

13. ***Stenoponia tripectinata acmaea*** subsp. nov.

The typical area of this subspecies is the Giza Province, on the west bank of the Nile opposite Cairo, extending west to the pyramids of Rawash and northwards over the southern border of the Beheira Province at El Khataba (or Khâtabba). A male from 40 km. west of Cairo has the abdomen so much contracted that the spinelets of terga IV and V cannot be studied ; the specimen may represent a cline towards *S. t. blanda*. The four specimens obtained by H. Hoogstraal far north, at Kafr el Battik, almost opposite Damietta (now Dumyat), are also better considered as atypical on account of the fact that the single male has 13 spines in the left genal comb and 15 in the right one, a degree of lopsidedness otherwise occurring only in Israel. The large area of lowland traversed by freshwater channels lying to the north and east of Cairo and including the Land of Goshen (where Pharaoh settled the family of Joseph) is as far as *Stenoponia* is concerned a blank. Excluding these atypical specimens, the material consists of fourteen males and twenty-two females.

The averages of the measurements of the head in the fourteen males are : AD 24·5, AC 22·4, BC 20·6, CD 27·5, BD 48·0, and in the twenty-two females AD 26·7, AC 24·5, BC 21·3, CD 30·7 and BD 53·5. As samples of the individual variation, the measurements of the two males and two females, of which one specimen of each sex has the longest measurement for AD and the other the shortest, are recorded : the measurements for these four specimens being for the male sex AD 27 and 22, AC 23 and 21, BC 18 and 18, CD 29 and 26, and BD 50 and 45 ; in the female sex AD is 29 and 24, AC 26 and 24, BC 21 and 21, CD 31 and 29 and BD 54 and 50. The number of spines in the genal combs varies in the males from 14 to 16 and in the females from 14 to 17, the percentages being in the male sex 21·4% of combs with 14 spines, 64·3% with 15 and 14·3% with 16, in the female 2·3% (one comb only) with 14 spines, 54·5% with 15, 38·7% with 16 and 4·5% with 17 spines ; the number of specimens in which the number of spines in the left and right combs differs by one spine is remarkably high, eight males and nine females (seventeen of the thirty-six specimens, or 47·2%) having this asymmetrical arrangement. The holotype is a specimen with 15 spines each side.

The sets of antepygidial bristles consist in the male of three or four bristles and in the female four or five, in the male 67·9% of the sets with three bristles and 32·1% with four, in the female 25% of the sets with four bristles and 75% with five ; it is rather surprising, and perhaps not a coincidence, that in the three males and three females with asymmetrical sets of antepygidials it is the left set which has a bristle less than the right, whereas in the asymmetrical antepygidial sets of the male from 40 km, west of Cairo, the male and one female from north of Shirbin, and a male of *S. t. blanda* it is the right side which has a bristle less. The average number of spines in the pronotal comb is 36·4 in the male and 38·4 in the female, and of the abdominal comb 35·5 in the male and 37·5 in the female ; frequently the pronotal comb has one or a few spines more than the abdominal comb, but the reverse also occurs.

Certain measurements (in units) of the thoracic nota and abdominal tergum I, together with averages (in brackets) in fourteen males and twenty-two females are given below :—

	Pronotum	Mesonotum	Metanotum	Abdominal tergum I
Variation in ♂	30–36 (av. 33·0)	35–41 (av. 36·8)	35–41 (av. 38·8)	28–35 (av. 32·6)
Variation in ♀	33–40 (av. 37·9)	40–47 (av. 44·4)	40–47 (av. 44·4)	34–40 (av. 37·9)
Length in ♂ with longest pronotum	36	40	41	34
Length in ♂ with shortest pronotum	30	36	36	30
Length in ♀ with longest pronotum	40	47	47	41
Length in ♀ with shortest pronotum	33	46	46	40

The totals of abdominal spinelets of individuals vary in the male from 14 to 24 (average 20) and in the female from 10 to 26 (average 19). Counts of the spinelets on segments II to V of the two males with the highest and lowest total numbers are 13 and 9 on II, 8 and 4 on III, 3 and 1 on IV and 0 and 0 on V ; corresponding counts for females are 14 and 6 on II, 8 and 4 on III, 4 and 0 on IV and 0 and 0 on V. The aggregate number of spinelets on the individual terga in the fourteen males is 150 on II (average 10·7), 85 on III (average 6·1), 39 on IV (average 2·8) and 2 on V (average 0·14) ; in the twenty-two females the aggregates are 240 on II (average 10·9), 137 on III (average 6·2), 40 on IV (average 1·8) and 0 on V. All the males have at least one spinelet on IV, whereas among the females there are four specimens in which IV has no spinelets ; the greater reduction in the female of spinelets on IV and the retention in one male of spinelets on V are in accord with the general trend of evolution in the *tripectinata* complex, the female being a step in advance of the male.

The spiniforms on the apical area of the underside of tarsal segment V can be counted in half the tarsi of the fourteen males (42 out of 84) and nearly half those of the twenty-two females (64 out of 132) ; the counts vary in the males from 6 to 9 and in the females from 6 to 8, the most interesting fact being some high counts on the hind tarsus of females. Of the males, one fore tarsus has 7, seven have 8, three have 9 (average 8·2), three mid tarsi have 7, six have 8, and one has 9 (average 7·8), seven hind tarsi have 6, ten have 7, three have 8 and one has 9 (average 6·9) ; in the females two fore tarsi have 6, eight have 7, and six have 8 (average 7·3), one mid tarsus has 6, eighteen have 7 and five have 8 (average 7·2), twelve hind tarsi have 6, seven have 7 and five have 8 (average 6·7).

The club of the ninth sternite of the male (Text-fig. 25) is nearly as convex below as above, its outline approaching symmetry. There is nothing in the clasper and phallosome distinguishing the present subspecies (Text-fig. 30).

HABITAT. Abu Rawash, Giza Province, Egypt, 18th March, 1952, in *Arvicanthis* nest 2 ♂, 2 ♀ ; El Mansuriya, Giza Province, 3rd April, 1952, from nest of *Gerbillus gerbillus*, 4 ♂, 6 ♀ ; Mansuriya, Giza Prov., edge of desert, from rodent's nest, December 1951, 2 ♀ ; Beni Salama, Giza Prov., 29th January, 1953, from *Gerbillus* burrow, 1♂ ; Abu Ghâlib, Imbaba, Giza Prov., 2nd May, 1951, from nest of *Gerbillus gerbillus*, 1 ♀ ; Kafr Hakim, Imbaba, Giza Prov., 6th February, 1953, from *Gerbillus* burrow, 1 ♂, 1 ♀ ; Mansuriya, Imbaba, Giza Prov., 12th February, 1953, from

Gerbillus gerbillus (probably a nest), 2 ♂ (including the holotype), 1 ♀; Mansuriya, Imbaba, Giza Prov., 9th March, 1953, from *Jaculus jaculus*, 1 ♀; Afifi Pasha, Ezbet Hafiz, Giza Prov., 29th March, 1952, from nest of *Jaculus jaculus*, 3 ♂, 6 ♀; El Khataba (or Khâtabba, a short distance north of Giza Prov.), Beheira Province, 29th January, 1953, from *Gerbillus* nest, 1 ♂, 2 ♀.

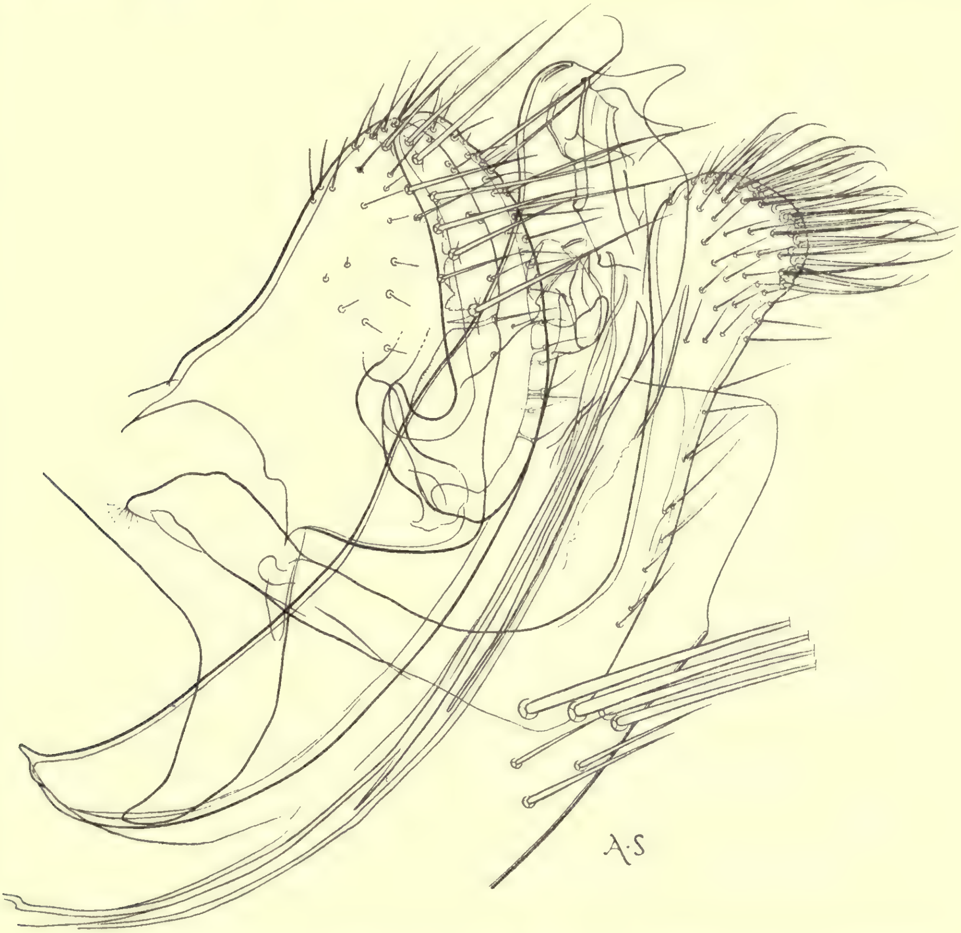

FIG. 30. Terminalia of male paratype of *Stenoponia tripectinata acmaea* ssp. nov.

The male from the Western Desert Province, 40 km. west of Cairo, 1st April, 1952, and the male and three females from Kafr el Battik, north of Shirbin, Gharbiya Province, February 1953, may provisionally be referred to as *S. t. acmaea* var. or cline.

The last remark applies likewise to the Palestinian specimens similar to *S. t. acmaea* of which Dr. O. Theodor has sent us two pairs and particulars of many other specimens. All the localities of these specimens are in or near the sand-dunes from a little north of Tel-Aviv southwards, as follows: Herzliah (about 15 km. north of Tel-Aviv), from *Gerbillus gerbillus*, one male, one female, Cholon (or Holon), just south of Tel-Aviv, from *Gerbillus pyramidum* and *G. gerbillus*, two pairs received from Dr. Theodor with details of two other pairs, Nahr Rubin, two males, two females, Rishon Lezion, from *Meriones crassus sacramenti. G. pyramidum* and *G. gerbillus*, six males, three females, Ashkelon, from *Gerbillus*, one male, Beersheba, from *G. pyramidum*, three males, six females, Revivim, 30 km. south of Beersheba, from *G. pyramidum* (rarely on *Meriones c. crassus*), four males, eight females. In these twenty-one males and twenty-four females the averages of the totals of the spinelets on abdominal terga II to V vary from 21 down to 11; there is only one specimen (a male) with a spinelet on V. In the males 97·6% of sets of antepygidial bristles consist of three and 2·4% of four, and the percentage with three would be 100% if the Herzliah male were excluded, in the females 35·4% of sets have four bristles and 64·6% are of five; in the male sex of these Palestinian specimens the percentages differ remarkably from those of typical *S. t. acmaea.* The number of spines in the genal comb varies in the males from 13 to 16 and in the females from 14 to 17; in the males 4·8% have 13 spines, 45·2% have 14, 40·5% have 15 and 9·5% have 16, the specimens with 13 and 14 spines in the combs of the two sides (Cholon and Rishon) are not matched in typical *S. t. acmaea*; in the females 12·5% of combs are of 14 spines, 64·5% of 15, 18·8% of 16 and 4·2% of 17 spines, combs with 14 and 15 spines being more numerous than in *S. t. acmaea* and those with 16 spines correspondingly less numerous. A more striking point, however, is the occurrence in the material from Israel of three further specimens with 2 more spines on one side of the head than on the other, a condition found only twice before. That these five cases of an unusual degree of lopsidedness, occurring in one Egyptian male (Gharbiya Province, north-eastern area of the Nile delta, with 13/15 spines), three males from Israel (foot of Mt. Carmel, with 12/14 spines, Beersheba, with 16/14 spines, and Revivim, with 14/16) and one female from Israel (Nahr Rubin, with 17/15 spines) are all from one small corner of the Middle East and nowhere else can hardly be accidental. Chiefly for comparison with *S. t. acmaea* we gave above the percentage of occurrence of various numbers of spines in the genal comb. Statistical facts of another kind arise from a comparison of the totals of genal spines on the two sides of each individual in the twenty-four females from Israel of the form resembling *S. t. acmaea*: the combination 14/14 = 28 spines occurs once, 14/15 or 15/14 = 29 spines twice each, 15/15 = 30 eleven times, 15/16 and 16/15 = 31 three times and once respectively, 16/16 = 32 twice, 17/16 = 33 once and 17/15 = 32 once. In other words, while uneven totals (29, 31 and 33) must represent heads with the number of spines in the genal combs of the two sides different, even totals may mean either that the counts on the two sides are the same (14/14 = 28, 15/15 = 30, 16/16 = 32) or that the combs are very strongly asymmetrical (17/15 in the female, 14/16 and 16/14 in males). Out of these twenty-four females, fifteen have an even number of spines in the genal combs of the two sides together, while in ten specimens the number of spines on the two sides is different.

Though the proportion of symmetrical and asymmetrical heads varies in different populations of the *tripectinata*-complex, in every such population more than half the individuals have even totals of genal spines on the two sides together.

The number and position of the genal spines are the result of two obvious main lines of evolution which are interdependent. The reduction of the abdominal spinelets in a forward direction reaches its maximum in the absence of spinelets on terga VI, V and IV in one individual of *S. t. acmaea* and in three from Israel, which suggests the possibility that there may be some place in the Middle East where tergum IV is without spinelets in all individuals. This reduction of the spinelets probably increases the amount of material available for forming the spines of the genal comb and thus helps to increase the number of them along the antennal fossa, the acme of this upward development bringing the uppermost spine close to the eye ; the black stripe from the eye upwards (the trabecula centralis of Wagner) is the place where the left and right sides of the head are united and its presence may prevent any further development upwards of the comb in *Stenoponia*, in which the highest combination yet known is 16/16 spines in the male and 16/17 (and 17/16) in the female, 17/17 being as yet unknown. As the Siphonaptera are holometabolous, the division, for forming the organs of the imago, of the material accumulated during the larval life takes place in the last larval stage and in the pupa under the control of the system of collaborating endocrines discovered by biochemists, the control continuing the orderliness which the taxonomic unit (in this case *S. t. acmaea* together with the *acmaea*-like specimens from Israel) has acquired in its evolution. In rather more than one-third of the specimens the left and right genal combs differ by one spine ; the endocrinal " board of control " is " accustomed " (so to speak) to pass this difference as correct, but when provided with material for an even-numbered division the error may occur that the line of division is one spine to the right or left, resulting in the strongly asymmetrical arrangement 14/16 or 16/14. It is possible that this combination may injuriously affect the viability of the specimen, which will die in the pupa or soon after emerging and thus rarely come into the hands of the collector. Whether this suggestion is correct or not, it does not account for the occurrence of the error only in one small area of the Middle East.

When eight specimens from Morocco with the same number of spines in the genal comb of each side of each individual were considered under *S. t. megaera* on p. 186, the question was put whether a series with symmetrical heads is taxonomically the same as a series from another locality in which the heads are often asymmetrical ; if 13/13 must be considered the same as 14/14, specimens with the combinations 13/14 and 14/13 belong to the same subspecies provided there are no other differences. Another question which was touched upon under *S. t. insperata*, on p. 189, is whether the number of genal spines depends on the size of the specimen ; measurements show that, though the smallest specimens within a subspecies do not have the maximum counts nor the largest the smallest ones, yet the specimen with the greatest number of spines is not necessarily the largest while the one with the smallest number of spines is not always the smallest specimen ; in *S. t. acmaea*, for instance, the largest specimen was a female with 15/15 spines in the genal combs, while specimens with 16/17 and 17/16 were smaller.

The spinelets of the abdominal terga vary much in size and number. Most of them are triangular and at least twice as long as broad. In one specimen tergum II bears dorsally on the left side 3 spinelets of which 2 are broken off but the third is intact, shaped like the spines of the abdominal comb but much shorter. In three specimens one of the terga has either on the left or right side a dark spine, shaped like a cigar and about half the length of the longest lateral spine of the abdominal comb, which is stuck by its broad end to the apical margin of the tergum. I look upon this as a remnant of spine-substance which was left over when all the spines and spinelets were formed and of which the metabolic factors disposed in this way.

The conspicuous asymmetry of the genal combs is repeated by the antepygidial bristles, evidently independently of the asymmetry of the genal combs. In all our specimens in which the sets of antepygidial bristles are asymmetrical the difference between left and right is one bristle, but Dr. V. E. Tiflov has discovered in one male of S. *ivanovi* a count of 4 antepygidials on the left side and only 2 on the right, and in a female of S. *suknevi* a count of 5 and 7 on the two sides.

SUMMARY

In this paper the genus *Stenoponia* has been divided into two sections. Section A contains eleven species, which have been grouped into defined subsections and the main distinctions of each species have been mentioned ; two of these species are Nearctic and the remainder are from the eastern portion (Siberian and Manchurian subregions) of the Palaearctic. Section B contains a single species, S. *tripectinata*, which occurs in the Mediterranean subregion and breaks up into numerous subspecies of which eleven have been described as new in this paper. All populations of this species are very variable and even the left and right sides of the same specimen are never exactly alike. These populations show two obvious lines of evolution which are interdependent : (1) development of the genal comb upwards along the margin of the antennal fossa (accompanied by an increase in the number of its spines) until the uppermost spine is close to the vestigial eye, and (2) a decrease in the number of marginal spinelets on the abdominal terga which takes place progressively from tergum VI forwards until VI and V (also IV in a few specimens) are without spinelets. More than half the specimens of S. *tripectinata* have the same number of spines in the genal combs of the two sides, but many have one spine more in the comb of one side than in that of the other and a few specimens (all from one area comprising part of Israel and an almost adjacent portion of northern Egypt) have a difference of two spines in the genal combs of the two sides. The number of antepygidial bristles varies independently in a similar manner.

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I am greatly indebted for assistance in carrying out this investigation to those who have provided me with material and information ; these include Dr. J. Bruneau of the Institut Pasteur du Maroc, Dr. E. W. Jameson of the University of California, Mr. Harry Hoogstraal of United States Naval Medical Research Unit No. 3, Dr. C. A. Hubbard of Tigard, Oregon, Professor O. Theodor of the Hebrew University of Jerusalem and his team of collaborators, Dr. V. E. Tiflov of the Parasitological Laboratory of the Stavropol Anti-Plague Institute, and Lt.-Col. Robert Traub of the United States Army Medical Research Unit in Malaya, to all of whom I wish to express my grateful thanks. I am also deeply indebted to Mr. Arthur Smith for the beautiful drawings from which Text-figs. 1, 12–14, and 26–30 have been reproduced.

BRITISH MUSEUM
10 MAR 1958

THE MEALY-BUGS (PSEUDOCOCCIDAE : HOMOPTERA)

DESCRIBED BY
W. M. MASKELL, R. NEWSTEAD,
T. D. A. COCKERELL AND E. E. GREEN
FROM THE ETHIOPIAN REGION

D. J. WILLIAMS

BULLETIN OF
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D. J. WILLIAMS
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Pp. 203–236 ; 10 *Text-figures*

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By D. J. WILLIAMS
Commonwealth Institute of Entomology

INADEQUATE descriptions have caused some difficulty in naming many African mealy-bugs submitted for identification and in order to facilitate this work in the future it was thought desirable to redescribe or review all the known species found south of the Sahara.

Mr. G. De Lotto of the Department of Agriculture, Kenya, and the present writer proposed to co-operate in this work of redescription, but due to difficulties of distance it was decided that it would be easier for one of us to deal with all of the species described from Africa by any given author, and to leave until later the description of new species. The first of these papers, dealing with the mealy-bugs described by H. C. James, has already been completed by Mr. De Lotto (*Bull. B.M.(N.H.) Ent.*, **5**, No. 5) and the present one will review all those mealy-bugs described by Maskell, Newstead, Cockerell and Green.

This work has been largely influenced by the recent publications of Ferris (*in* Zimmerman, 1948) and Ferris (1950) dealing with the mealy-bugs of North America and many of the terms adopted by Ferris will be used here. Reference has also been made to Borkhsenius (1949), writing on the mealy-bugs of the U.S.S.R., and to a recent paper by Ezzatt & McConnell (1956) dealing with the tribe Planococcini. Many species found in Africa have been adequately described and illustrated in the foregoing papers and, therefore, it is not intended to redescribe them here.

Some of the species to be dealt with cannot be properly assigned to any known genus and as the main purpose of the present paper is to redescribe species, the erecting of new genera, where necessary, will be left until later. However, where species can definitely be placed in a known genus, this has been done. Species have also been included here that have been received from Africa in recent years but that have not hitherto been recorded from the Ethiopian Region. Certain African mealy-bugs have not been collected since the original discovery and are therefore represented by type material only. Complete lists of the known hosts, and distribution records, will be given in a later paper.

The writer wishes to thank Dr. St. von Keler of the Zoologisches Museum, Berlin, for lending type preparations of *Ripersia glandulifera* Newst., and Dr. D. Miller, Cawthron Institute, Nelson, New Zealand, for lending preparations and material of *Dactylopius vastator* Mask., *Chaetococcus bambusae* Mask., and *Pseudococcus graminis* Mask. Mr. G. De Lotto has kindly sent material of *Pseudococcus graminis* Mask., from Kenya and given invaluable help in other ways.

THE SPECIES DESCRIBED BY W. M. MASKELL

Seven species described by Maskell are herein discussed from the Ethiopian Region of which six are regarded as valid species. The only species described originally from Africa is *Nipaecoccus graminis*, the others having been described from elsewhere and recorded from this region later. Illustrations are given of *Chaetococcus bambusae* and *Nipaecoccus graminis*, the remaining species having been illustrated already by other workers.

Antonina graminis (Maskell)

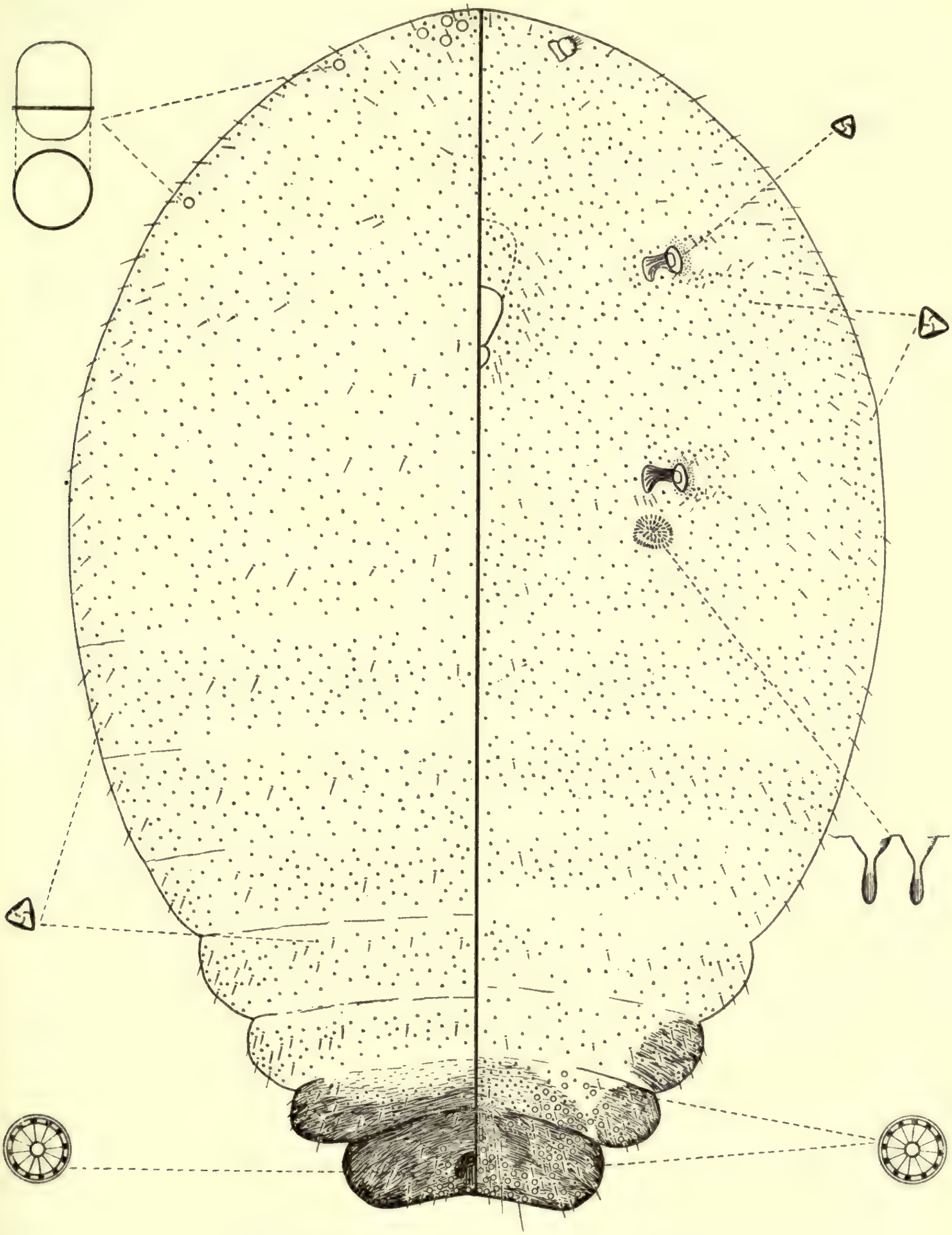
Sphaerococcus graminis Maskell, 1897, *Ent. mon. Mag.* **33** : 244.
Antonina graminis (Maskell), Fernald, 1903, *A Catalogue of the Coccidae of the World* : 121.
Antonina indica Green, 1908, *Mem. Dep. Agric. India, Ent.* **2** : 2.
Antonina indica Green, James, 1934, *Stylops*, **3** : 272.
Antonina graminis (Maskell), Zimmerman, 1948, *Insects of Hawaii*, **5** : 156.
Antonina indica Green, Mamet, 1949, *Mauritius Inst. Bull.* **3** : 9.
Antonina graminis (Maskell), Ferris, 1953, *Atlas of Scale Insects of North America*, **6** : 294.

There are few records of this grass-feeding species from the Ethiopian Region but material received in recent years suggests that it is much more widely spread than hitherto supposed. The African records have been under *A. indica* Green originally described from India and this has been synonymized with *A. graminis* Maskell by Ferris (*in* Zimmerman, 1948) where he gave a description and diagram. A further description and diagram were given by Ferris (1953) stating that the species lacked trilocular pores, contrary to his 1948 description. The later description was from material collected at Kingsville, Texas, but specimens have been examined by the writer from the same locality which show the dorsal trilocular pores clearly. Dr. H. Morrison of the U.S. Dept. Agric. Washington has kindly examined an adult of *graminis* from the Maskell collection. This specimen is apparently in poor condition but he believes that dorsal trilocular pores are present as they are likewise in the Texas material. All the African species studied have the dorsal trilocular pores in variable numbers but in certain specimens they are difficult to recognize because of the heavy sclerotization.

Chaetococcus bambusae (Maskell)

(Text-fig. 1)

Sphaerococcus bambusae Maskell, 1892, *Trans. N.Z. Inst.* **25** : 237.
Chaetococcus bambusae (Maskell), 1898, *Trans. N.Z. Inst.* **30** : 249.
Sphaerococcus bambusae Maskell, de Charmoy, 1899, *Proc. Soc. Amic. Sci.* : 48.
Antonina bambusae (Maskell), Mamet, 1949, *Mauritius Inst. Bull.* **3** : 8.



TEXT-FIG. 1. *Chaetococcus bambusae* (Maskell)

This species was originally described from Hawaii and has since been recorded from various parts of the world on bamboo. Specimens from the Ethiopian Region are at hand from Dakar, Senegal collected by J. Risbec and from Amani, Tanganyika and the species has been recorded from Mauritius. The following description and the diagram are based mainly on young adult females collected by E. M. Ehrhorn in Hawaii.

HABIT. A large conspicuous species on the leaf sheath of bamboo and surrounded by a secretion of white wax.

RECOGNITION CHARACTERS. Body of adult female turbinate each abdominal segment reduced in width posteriorly so that the abdomen tapers characteristically. In the old adults the body becomes so heavily sclerotized that it is impossible to recognize the microscopic characters. Mature specimens attaining a length of 6 mm., it becoming a large species. Antennae reduced to two or three segments, the distal segment bearing numerous setae. Legs entirely absent. Anal ring with six setae borne at the inner end of a shallow tube. Circulus absent. Dorsal ostioles lacking. Dorsal surface with at least the two posterior segments sclerotized even in the very young adults. Setae sparse, of various lengths but all short and slender, more numerous around the margins. Multilocular disc pores on the terminal abdominal segment only, situated about the area lateral and posterior to the anal tube, numbering about twenty pores altogether. Trilocular pores rather numerous and evenly distributed except on the posterior segment where they are sparse and accompany the multilocular pores. Around the anterior margins are tubular pores which are a little larger in diameter than the multilocular pores, the external part of each pore being in the shape of a shallow dome. These pores vary in number, there being only two present in some specimens whilst other specimens have up to fifteen where they are more numerous on the anterior margin and often reach posteriorly to the thorax. Dorsal tubular ducts absent. Simple circular pores scattered over the surface in no definite arrangement.

Ventral surface of the body of the young adults with posterior segments heavily sclerotized. This sclerotization develops in a characteristic manner commencing in the mid-region and the marginal areas. Setae sparse, of various lengths but all slender, more numerous around the margins and on the terminal segment where they occupy the mid-region and submarginal areas. Some of these setae, especially on the posterior margin, are longer than the others. Multilocular disc pores confined to the two posterior segments. On the terminal segment they are numerous in the mid-region, the posterior margin and the submarginal area, whilst on the penultimate segment they occupy the submarginal areas only. Trilocular pores abundant and evenly distributed except on the terminal segment where they are associated with the multilocular pores. Trilocular pores distinctly smaller than the others on the venter are situated on the spiracular plates. Small tubular ducts are present in an oval group behind each second spiracle. These ducts are funnel-shaped and heavily sclerotized. Simple circular pores distributed over surface.

NOTES. Maskell described this species in *Sphaerococcus* and later erected the genus *Chaetococcus* for it. For some time the species has been associated with the genus *Antonina*. Morrison & Morrison (1922) redescribed the genus *Chaetococcus* and also the species *bambusae* and considered that *Chaetococcus* was doubtfully distinct from *Antonina*. Borkhsenius (1949) has recently resurrected the genus *Chaetococcus* for four species stating that it differs from *Antonina* mainly in having a group of small cylindrical pores behind the second spiracle and that the anal ring lies either on the surface or at the inner end of a shallow tube instead of a long tube as in *Antonina*. It seems possible that the genus is distinct from *Antonina* but a study of more species is desirable.

Nipaecoccus aurilanatus (Maskell)

Dactylopius aurilanatus Maskell, 1899, *Trans. N.Z. Inst.* **22** : 151.
Pseudococcus aurilanatus Fernald, 1903, *A Catalogue of the Coccidae of the World* : 97.
Pseudococcus aurilanatus Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 107, 108.
Nipaecoccus aurilanatus Ferris, 1950, *Atlas of Scale Insects of North America,* **5** : 104.

In the Ethiopian Region this species is known from South Africa only on various species of *Araucaria*. Material has been examined from Braamfontein, Johannesburg collected by B. J. Boonzain 2.vi.23 and from Natal collected by C. Fuller. Ferris (1950) has placed this species in the genus *Nipaecoccus* Sulc and has illustrated it.

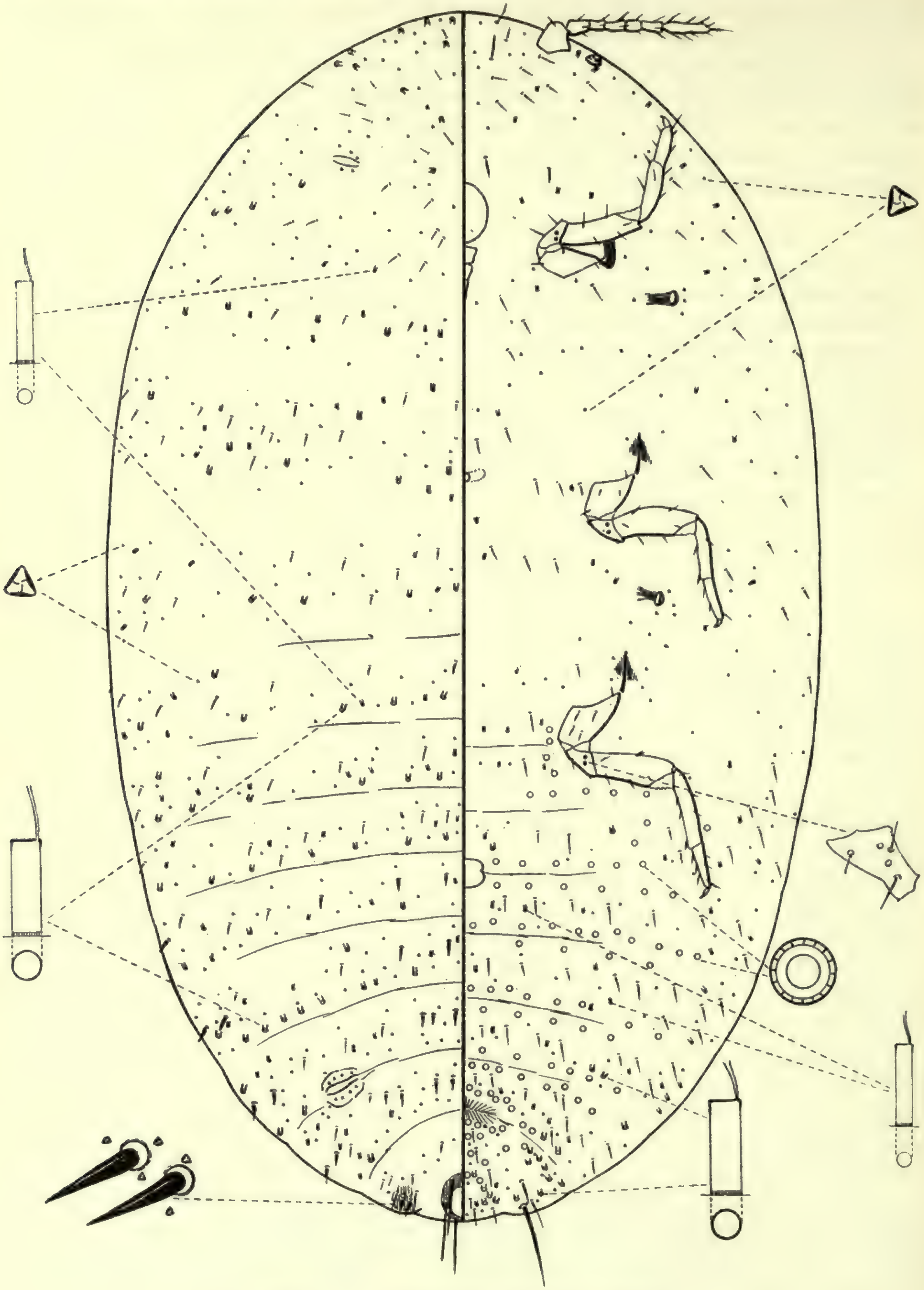
Nipaecoccus graminis (Maskell) ***(comb. nov.)***

(Text-fig. 2)

Dactylopius graminis Maskell, 1891, *Trans. N.Z. Inst.* **24** : 36.
Dactylopius filamentosus small variety Cockerell, 1901, *Ent. mon. Mag.* **31** : 167.
Pseudococcus natalensis Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 100 (SYN. NOV.).
Pseudococcus graminis (Maskell), Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 118.
Trionymus natalensis Brain, Laing, 1929, *Ann. Mag. nat. Hist.* (X), **4** : 470.

HABIT. Described by Maskell as " enclosed in a sac of white felted secretion, aggregated in masses thickly covering stems of grass ; the sacs are of irregularly elliptical form ".

RECOGNITION CHARACTERS. Body of adult female blue-green at maturity this colour changing to brown during the preparation of specimens. An elongate-oval species, as mounted on the slide measuring approximately 3 mm. × 2 mm. Antennae short, seven-segmented. Legs rather short and slender with a few translucent pores on hind coxae. Trochanters very distinctive, each with an apical projection and described by Brain as shoe-shaped. Dorsal ostioles poorly developed, the anterior pair not so discernible as posterior pair, the lips of both pairs with a few trilocular pores but apparently without setae. Anal ring with six setae which are slightly longer than the ring. Dorsal surface with a reduced number of cerarii, there being only about five pairs present on the abdomen. Anal lobe cerarii composed of two stout lanceolate setae and one or two trilocular pores surrounded by a small sclerotized area. The setae comprising the other cerarii becoming more widely separated anteriorly, these of similar shape to those on anal lobes and without the cluster of trilocular pores. Dorsal setae not numerous. On the mid-region of the posterior abdominal segment they are stoutly lanceolate and of a similar shape and size to



TEXT-FIG. 2. *Nipaecoccus graminis* (Maskell).

those of the cerarii. Other setae slender and of various sizes but all small. Dorsal multilocular disc pores absent. Tubular ducts of two sizes, rather sparse, the most numerous being rather large and situated in more or less single transverse rows on the head, thorax and anterior abdominal segments. On the seventh and eighth segments a few are located on the margins whilst they are absent on the ninth segment. Smaller tubular ducts interspersed with the larger type but these are sparse on the head. They tend to replace the larger ducts on the seventh and eighth segments and are absent on the ninth segment. Trilocular pores very few and evenly distributed.

Ventral surface of the body with a pair of anal lobe setae, longer and stouter than anal ring setae. Other setae few, slender but tending to be longer than those on dorsal surface. Multilocular disc pores on abdomen only arranged in single transverse rows on the anterior and posterior edges of the segments except the second to fourth segments where they mainly occupy the posterior edges. There is a group of about twenty disc pores posterior to the vulva and others are present in the submarginal zones. Large tubular ducts similar to the large type on the dorsum, few in number, there being one or two in the mid-region of the fourth segment, a group of two or three near the margin of seventh and eighth segments. They are most numerous just anterior and between the anal lobes. The small type is very sparse, a few being present on the head and thorax and others are present on the abdomen in single transverse rows and in a submarginal zone. Trilocular pores few and scattered. Simple circular pores apparently absent.

NOTES. This species seems to be a typical *Nipaecoccus* in possessing anal lobe cerarii with two conical setae and with three to four pairs of abdominal cerarii each with a pair of widely separated conical setae devoid of trilocular pores. The setae on the posterior dorsal segments are also similar to those of the cerarii. As pointed out by Brain in his description of *natalensis* the species is easily characterized by the peculiar trochanters, each of which has an apical projection.

Through the kindness of Dr. D. Miller of the Cawthron Institute, Nelson, New Zealand, it has been possible to see type material of *graminis*. An examination of type material of *Pseudococcus natalensis* Brain shows that this is the same as *graminis*. According to Brain (1915) the species mentioned by Cockerell (1901) as *Dactylopius filamentosus* small variety is also to be referred to *natalensis*. Some excellent specimens have kindly been given by Mr. G. De Lotto from Nairobi, Kenya, and the diagram shown herewith is based on this material. The species has been described from Natal under *graminis* and *natalensis* and it has been recorded from Uganda under *natalensis* by Laing (1929).

Nipaecoccus nipae (Maskell)

Dactylopius nipae Maskell, 1892, *Trans. N.Z. Inst.* **25** : 230.
Pseudococcus nipae (Maskell), Fernald, 1903, *A Catalogue of the Coccidae of the World* : 107.
Pseudococcus nipae (Maskell), Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 102.
Pseudococcus nipae (Maskell), Hall, 1937, *Trans. R. ent. Soc. Lond.* **86** : 128.
Nipaecoccus nipae (Maskell), Sulc, 1945, *Acta. Soc. Sci. nat. Morav.* **17** : 1–48.
Nipaecoccus nipae (Maskell), Ferris, 1950, *Atlas of Scale Insects of North America*, **5** : 109.

Brain (1915) has recorded this species from Cape Province, Natal and Transvaal on cultivated palms. Specimens have been examined from Salisbury, Southern Rhodesia, collected by W. J. Hall on *Chamaerops excelsa*. The species has been adequately described and illustrated by Ferris (1950).

Nipaecoccus vastator (Maskell)

Dactylopius vastator Maskell, 1894, *Trans. N.Z. Inst.* **27** : 74.
Dactylopius viridis Newstead, 1894, *Ind. Mus. Notes*, **3** : 25 (SYN. NOV.).
Dactylopius vastator Maskell, de Charmoy, 1899, *Proc. Soc. Amic. Sci.* : 45.
Pseudococcus viridis (Newstead), Fernald, 1903, *A Catalogue of the Coccidae of the World* : 112.
Pseudococcus perniciosus Newstead & Willcocks, 1910, *Bull. ent. Res.* **1** : 2.
Pseudococcus filamentosus Cockerell, Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 99 (misidentification).
Pseudococcus hymenocleae Cockerell, Newstead, 1917, *Bull. ent. Res.* **8** : 127 (misidentification).
Pseudococcus perniciosus var. Newstead, 1920, *Bull. ent. Res.* **10** : 178, 179.
Pseudococcus filamentosus var. *corymbatus* Green, 1922, *The Coccidae of Ceylon*, **5** : 379 (SYN. NOV.).
Pseudococcus perniciosus Newstead & Willcocks, James, 1933, *Bull. ent. Res.* **24** : 435.
Trionymus sericeus James, 1936, *Trans. R. ent. Soc. Lond.* **35** : 203 (SYN. NOV.).
Pseudococcus filamentosus Cockerell, Hall, 1937, *Trans. R. ent. Soc. Lond.* **86** : 126 (misidentification).
Pseudococcus vastator (Maskell), Zimmerman, 1948, *Insects of Hawaii*, **5** : 245.
Nipaecoccus vastator (Maskell), Ferris, 1950, *Atlas of Scale Insects of North America*, **5** : 103.

Ferris (*in* Zimmerman, 1948) has already drawn attention to the confusion existing in the literature of erroneous records of *filamentosus* throughout the world when, so far as is known, this species is confined to North America. The main cause of the confusion was the Fernald Catalogue and its listing in error of *vastator* as a synonym of *filamentosus*, the two species being quite distinct. Ferris has already pointed out that *perniciosus* is a synonym of *vastator*. It is the opinion here that all African material identified as *filamentosus* and *perniciosus* represents the same species redescribed by Ferris (*in* Zimmerman, 1948) as *vastator*. An examination of the type material of *vastator*, described from Hawaii, has been made, this having been lent through the kindness of Dr. D. Miller, Cawthron Institute, New Zealand.

Many specimens have been examined from material collected in Africa and the Indian Region. Illustrations of *vastator* have been given by Ferris (*in* Zimmerman, 1948) from Hawaiian material and also by Ferris (1954). The ventral tubular ducts have been described as of one size whereas, in fact, these ducts are of two sizes, one being slightly shorter and about half the diameter of the other. Material at hand collected by Ehrhorn in Hawaii shows this distinctly as does the type material. There is considerable variation in all the material seen, the most notable differences being the number of multilocular disc pores around the ventral margins. On one side there are up to 50 of these pores in the type material of *vastator* but in other material there are upwards of 200 pores with a corresponding increase in the number of tubular ducts. This wide variation, however, with all the intermediate forms, is present in specimens from both Africa and the Indian Region and there are no definite characters which warrant their separation into different species. Ferris was correct, therefore, in synonymizing *perniciosus*, described from Egypt, with *vastator*. Type material of *corymbatus* Green from Ceylon and also type material of *viridis* Newstead described from India come within this range and both species are here sunk as synonyms of *vastator*. Mr. De Lotto has studied *Trionymus sericeus* James and has recently illustrated this when redescribing the James species (in press). There is a relatively large number of the ventral multilocular disc pores in this species but as it comes within the range of variation it is necessary that *sericeus* be reduced to a synonym of *vastator*, a decision with which Mr. De Lotto is in accord. Mr. De Lotto also agrees with the other synonymy above and it is hoped that the foregoing will help to clarify the position until such times as biological evidence is forthcoming which may prove otherwise.

There is a point of nomenclature which is of interest here. It has been impossible to ascertain the correct date of publication of the species described by Newstead as *Dactylopius viridis* in the *Indian Museum Notes*, **3**, No. 5 : 25, 1894. There is a printers' date on the final page of this part given as the 14th November, 1894, but the paper is listed in the *Zoological Record* under 1895. The Maskell species described as *Dactylopius vastator* was published in the *Transactions of the New Zealand Institute*, 1894, **27** : 74 with a note at the beginning of the paper that it was read before the Wellington Philosophical Society on the 14th November, 1894. This paper was actually issued in May, 1895. Should the description of the Indian species be found to be published before the description of *vastator* then *viridis* must take priority but until then the writer would prefer to use *vastator* as this name has now become widely established.

Pseudococcus calceolariae minor (Maskell) = ***Planococcus citri*** (Risso)

Dactylopius calceolariae var *minor* Maskell, 1896, *Trans. N.Z. Inst.* **29** : 322.
Pseudococcus calceolariae var. *minor* (Maskell), Fernald, 1903, *A Catalogue of The Coccidae of the World* : 99.

Described originally from Mauritius on " roots of onion grass ", this species is now known to be a synonym of *Planococcus citri* (Risso) and, therefore, it will not be discussed further in this work.

THE SPECIES DESCRIBED BY T. D. A. COCKERELL

Two of the six species discussed here are shown to have been misidentified in the past. These are the records of *Pseudococcus hymenocleae* and *Pseudococcus filamentosus*. The other four species are widely distributed and have been illustrated elsewhere.

Dysmicoccus brevipes (Cockerell)

Dactylopius brevipes Cockerell, 1893, *Entomologist*, **26** : 267.
Pseudococcus brevipes (Cockerell), Fernald, 1903, *A Catalogue of The Coccidae of the World* : 98.
Pseudococcus bromeliae (Bouché), Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 109.
Pseudococcus crotonis Green, 1916, *Bull. ent. Res.* **6** : 375 (misidentification).
Pseudococcus cannae Green, 1934, *Stylops*, **3** : 162 (SYN. NOV.).
Pseudococcus brevipes (Cockerell), Mamet, 1941, *Bull. ent. Res.* **32** : 57.
Pseudococcus cannae Green, Mamet, 1949, *Mauritius Inst. Bull.* **3** : 13.
Dysmicoccus brevipes (Cockerell), Ferris, 1950, *Atlas of Scale Insects of North America*, **5** : 59.

This species is probably distributed throughout Africa on various hosts although it is more widely known as a pest of pineapple. It has been described and illustrated by Ferris (1950) but mention may be made here of some characteristic pores which were presumably missing in the specimens seen by Ferris. An examination of numerous specimens from all parts of the world has shown that on the dorsal surface just anterior to the anus there is a variable number of disc pores which are intermediate in size between the trilocular and multilocular disc pores. Some specimens, however, are lacking these disc pores but this condition seems to be the exception.

Mamet (1949) has recorded *Pseudococcus cannae* Green from Mauritius but there is no reason to recognize this species as distinct from *brevipes*. Green (1934) described this species from Ceylon stating that it differs from *brevipes* mainly in possessing more slender legs and antennae. These are variable characters, however, and *cannae* comes well within the range of variation of *brevipes* throughout the world.

Ferrisiana virgata (Cockerell)

Dactylopius virgata Cockerell, 1893, *Entomologist*, **26** : 178.
Dactylopius virgatus (Cockerell), de Charmoy, 1899, *Proc. Soc. Amic. Sci.* : 44.
Pseudococcus virgatus (Cockerell), Fernald, 1903, *A Catalogue of The Coccidae of the World* : 111.
Pseudococcus virgatus var. *madagascariensis* Newstead, 1908, *Quart. J. Inst. Comm. Res. Trop., Lpool.* **3** : 9.
Dactylopius (*Pseudococcus*) *virgatus* var. *madagascariensis* Newstead, 1911, *Mitt. zool. Mus.. Berl.* (V) **2** : 166.
Dactylopius (*Pseudococcus*) *virgatus* var. *madagascariensis* Newstead, 1913, *Trans. R. ent. Soc. Lond.* : 523.
Dactylopius (*Pseudococcus*) *virgatus* var. *madagascariensis* Newstead, Lindinger, 1913, *Jb. hamburg, wiss. Anst.* **30** : 68.
Pseudococcus virgatus (Cockerell), Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 133.
Pseudococcus virgata (Cockerell), Newstead, 1917, *Bull. ent. Res.* **8** : 127.
Ferrisia virgata (Cockerell), James, 1933, *Bull. ent. Res.* **24** : 435.
Ferrisiana virgata (Cockerell), Colizza, 1933, *Boll. Soc. ent. ital.* : 65–66.
Ferrisia virgata (Cockerell), Hall, 1943, *J. ent. Soc. S. Afr.* **6** : 5.
Ferrisia virgata (Cockerell), Mamet, 1949, *Mauritius Inst. Bull.* **3** : 9.
Ferrisiana virgata (Cockerell), Ferris, 1950, *Atlas of Scale Insects of North America*, **5** : 93.
Ferrisia virgata (Cockerell), Mamet, 1951, *Mém. Inst. sci. Madagascar*, **5** : 215.

The above list represents all the African records to date. This is possibly one of the commonest mealy-bugs in Africa and will probably be found throughout the continent on many hosts. Mamet (1951) has recently synonymized the variety *madagascariensis* Newst. with *virgata*.

Planococcus lilacinus (Cockerell)

Pseudococcus lilacinus Cockerell, 1905, *Proc. Davenport Acad. Sci.* **10** : 128.
Tylococcus mauritiensis Mamet, 1939, *Trans. R. ent. Soc. Lond.* **5** : 89.
Planococcus lilacinus (Cockerell), Ezzatt & McConnell, 1956, *Univ. Maryland Agric. Exp. Sta. Bull.* A–**84** : 89–93.

It has already been noted by Le Pelley (1943) that confusion has existed in records of *Pseudococcus lilacinus* Cockerell in East Africa on coffee when the species involved is now known as *Planococcus kenyae* (Le Pelley). So far as is known *P. lilacinus* has never been collected on the African continent but material is at hand from Mauritius and Madagascar, the former kindly made available by Dr. R. Mamet. The species has recently been discussed in detail and illustrated by Ezzatt & McConnell (1956).

Pseudococcus filamentosus Cockerell

A discussion of this species and its records in Africa will be found herein under *Nipaecoccus vastator* (Maskell). The species has been shown by Ferris (1950) to be of North American distribution only and that the other records throughout the world are open to question.

Pseudococcus hymenocleae Cockerell

Pseudococcus hymenocleae Cockerell, Newstead, 1917, *Bull. ent. Res.* **8** : 127.

Newstead recorded this species from South Africa in 1917 but an examination of his material shows that this was misidentified. The specimens are, in fact, *Nipaecoccus vastator* (Maskell) discussed elsewhere in this work.

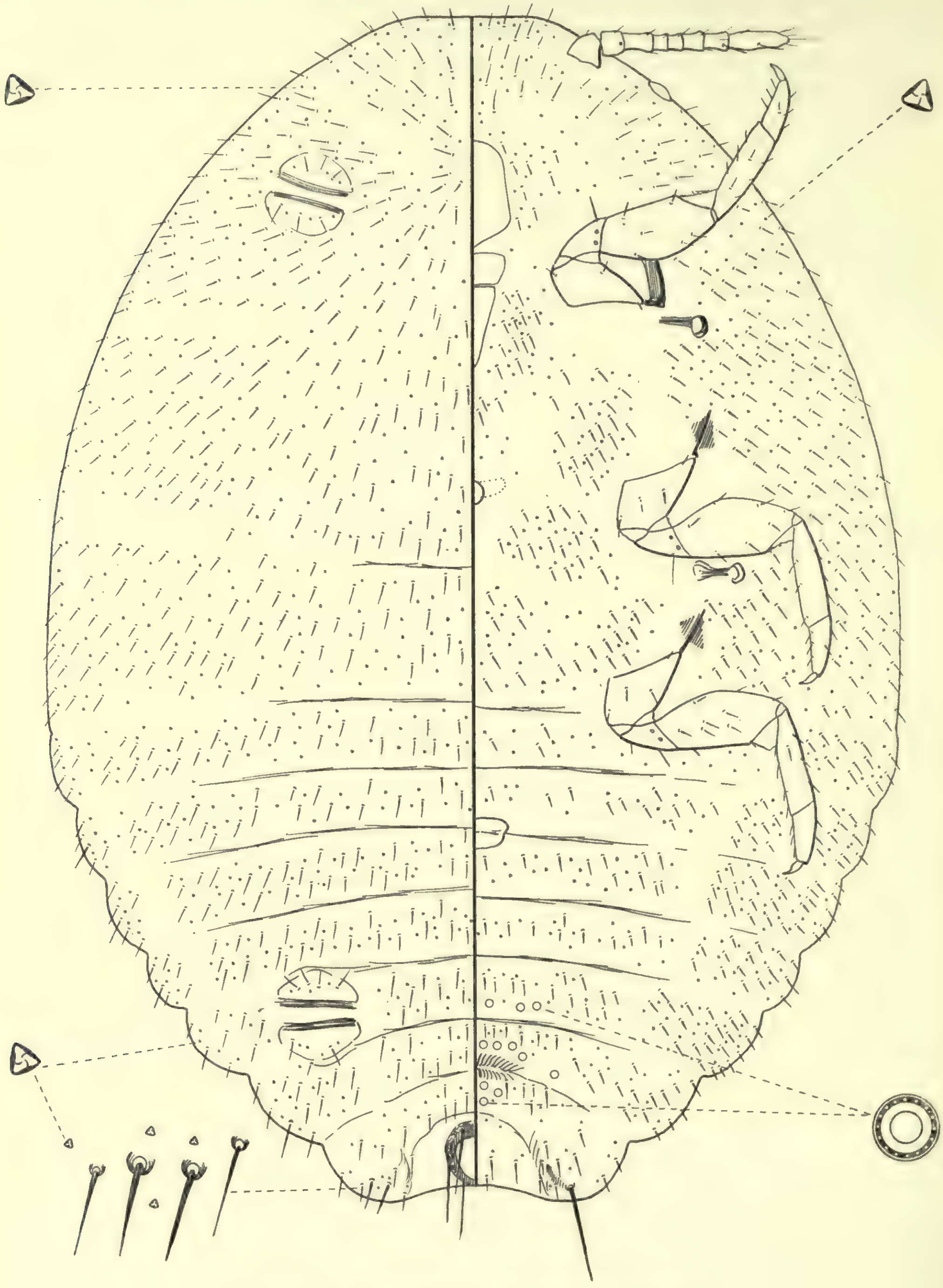
Saccharicoccus sacchari (Cockerell)

Dactylopius sacchari Cockerell, 1895, *J. Trinidad Field Nat. Club,* **2** : 195.
Dactylopius sacchari Cockerell, de Charmoy, 1899, *Proc. Soc. Amic. Sci.* : 45.
Pseudococcus sacchari (Cockerell) Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 127.
Trionymus sacchari Cockerell, Hall, 1937, *Trans. R. ent. Soc. Lond.* **86** : 134.
Trionymus sacchari Cockerell, Mamet, 1949, *Mauritius Inst. Bull.* **3** : 17.
Saccharicoccus sacchari (Cockerell), Ferris, 1950, *Atlas of Scale Insects of North America,* **5** : 217.
Saccharicoccus sacchari (Cockerell), Mamet, 1953, *Mem. Inst. sci. Madagascar,* **3** : 11.

This species attacking sugar-cane is apparently not too widely spread in Africa. It has been recorded from South Africa by Brain (1915), from Southern Rhodesia by Hall (1937) and from Mauritius by de Charmoy (1899) and Mamet (1949). Mamet has recently recorded the species from Madagascar. Most of the records in the past have been under *Trionymus* but the species was placed in the genus *Saccharicoccus* by Ferris (1950) where it is illustrated.

THE SPECIES DESCRIBED BY R. NEWSTEAD

At the beginning of the century Newstead had the opportunity of studying and describing a large amount of African material. Of the eight mealy-bugs described by him only four are valid species but these are rather interesting and typically African. Three of these, *Eurycoccus coccineus*, *Ripersia glandulifera* and *Tylococcus madagascariensis*, have not been collected again since the original discoveries.



TEXT-FIG. 3. *Eurycoccus coccineus* (Newstead).

Eurycoccus coccineus (Newstead) ***(comb. nov.)***

(Text-fig. 3)

Dactylopius coccineus Newstead, *In* Sjöstedt, 1908, *Wiss. Ergeb. Schwed. Zool. Expdn. Kilimandjaro, Meru*, 1905-1906, **12** : 8, 9.

Habit. Described from Steppe, Kiraragua, Kilimanjaro on Acacias. Newstead stated that the external covering was missing.

Recognition characters. Adult female broadly oval, as mounted on the slide 1·5 mm. × 1·2 mm. Antennae rather short, eight-segmented. Legs tending to be small, short and stout. Circulus large and divided by a transverse fold. Anterior and posterior ostioles well developed, moderately sclerotized, with three to four setae and about three trilocular pores on each lip. Anal ring with six setae, each slightly longer than the diameter of the ring. Cerarii present as a single pair on the anal lobes, each cerarius composed of two, long, slender setae, these only slightly stouter than the two or three auxiliary setae. Trilocular pores surrounding each anal lobe cerarius numbering three or four. Dorsal setae slender, of various lengths but mainly short and rather numerous. Trilocular pores evenly distributed, not numerous. Dorsal tubular ducts absent.

Ventral surface with a small area of sclerotization on each anal lobe. Anal lobe setae longer and stouter than the anal ring setae. Other setae of various lengths but mostly short and slender and more numerous in a submarginal zone. Multilocular disc pores of usual type on the seventh, eighth and ninth segments only. There are about six pores on the seventh segment, ten pores on the eighth segment, these in single transverse rows. In the available specimens there is an average total of twenty pores. Trilocular pores sparse, more numerous towards the margins. Tubular ducts absent. A few simple circular pores present in no definite arrangement.

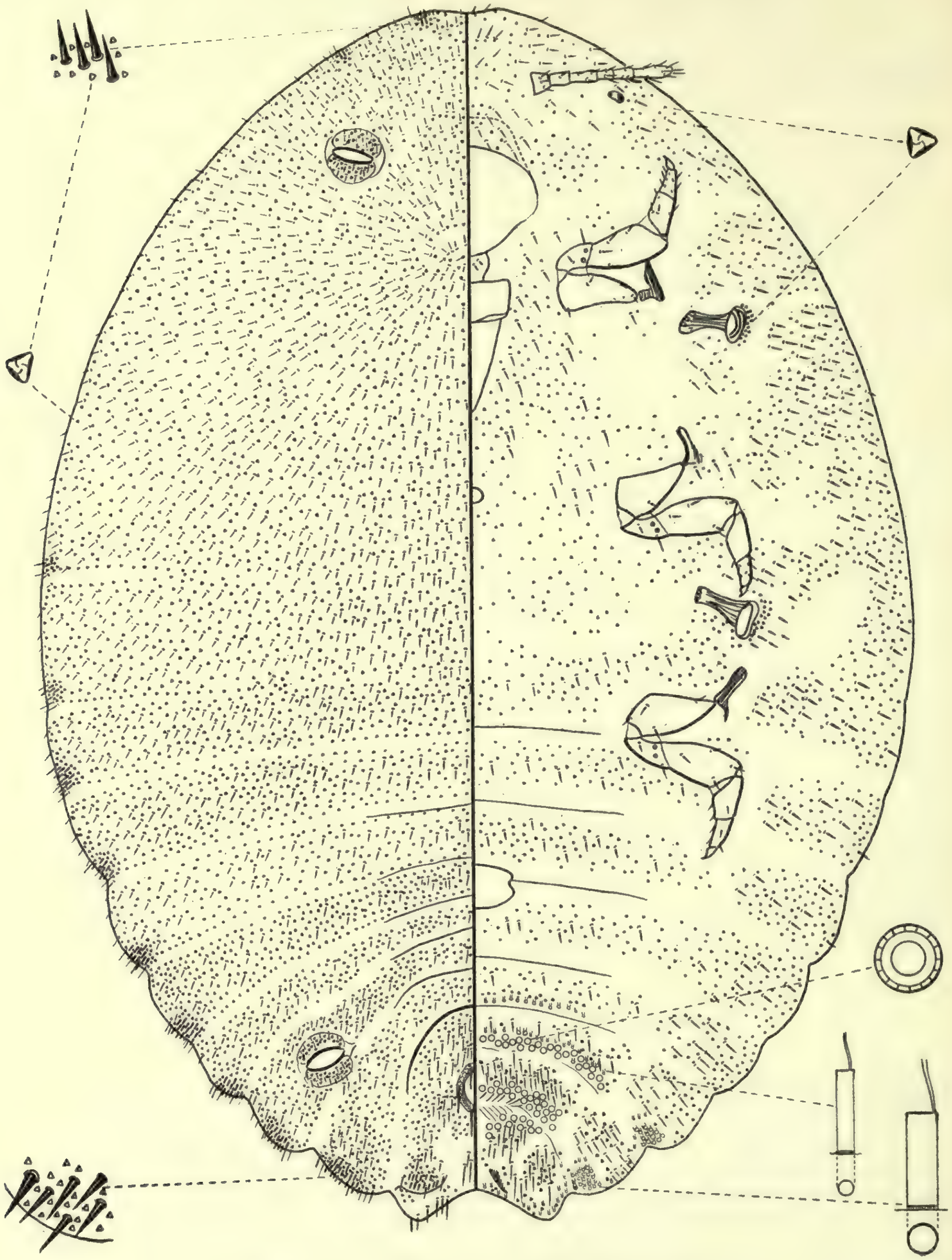
Notes. This species has not been collected since the original discovery. It seems to belong to the genus *Eurycoccus* as recently defined by Ferris (1950). Most of the specimens seen show the circulus folded but in one specimen the circulus is large and divided by a transverse fold. The single pair of cerarii is typical of those in the known species. The nearest species is apparently *Eurycoccus jessica* (Hollinger) described from Missouri, U.S.A. but *coccineus* differs mainly in possessing more multilocular disc pores and in lacking the ventral tubular ducts.

Paraputo anomala (Newstead) ***(comb. nov.)***

(Text-fig. 4)

Ripersia anomala Newstead, *In* Sjöstedt, 1908, *Wiss. Ergeb. Schwed. Zool. Expdn. Kilimandjaro, Meru*, 1905–1906, **12** : 9, 10.
Paraputo ritchiei Laing, 1929, *Ann. Mag. nat. Hist.* (10) **4** : 473, 474 (syn. nov.).
Paraputo multispinosa James, 1935, *Stylops*, **4** : 233.
Paraputo ritchiei Laing, Strickland, 1947, *Bull. ent. Res.* **38** :512, 513.
Paraputo ritchiei Laing, Ferris, 1955, *Microentomology*, **20**, : 5.

Newstead originally described this species from Kiboroto, Kilimanjaro, as living under the bark accompanied by small black ants (*Pheidole megacephala*). He stated



TEXT-FIG. 4. *Paraputo anomala* (Newstead).

that the insect resembled a species of *Dactylopius* in life. Strickland (1947) states that in life the insect is " covered with white wax, of a lumpy nature, the lumps thicker and larger at the lateral edges of the segments. With 12 pairs of lateral wax filaments ". The species is illustrated and redescribed from type material of *ritchiei* the preparations of which proved more favourable.

RECOGNITION CHARACTERS. Body of adult female broadly oval, as mounted on the slide the largest specimens attaining a size of 4·5 mm. × 4·0 mm. thus being quite a large species. Antennae short, six-segmented. Legs short and stout, the posterior coxae with a few translucent pores. Circulus present, well developed. Anal ring situated nearly three times its length from the apex of the abdomen, with six setae all of which are about half the length of the ring. Spiracles noticeably large and heavily sclerotized. Dorsal ostioles well developed, the lips with numerous short slender setae and trilocular pores, the inner edges sclerotized. Anal lobes protruding. Dorsum with a reduced number of cerarii, these varying in number from 11 to 13 distinct pairs. There are always the frontal and pre-ocular cerarii present and cerarii are usually absent on the pro- and mesothorax. In all cases the anal lobe cerarii are each composed of about 15 short conical setae surrounded by numerous trilocular pores. The penultimate cerarii are usually the largest each containing up to 25 conical setae. Anteriorly the cerarii become smaller so that on the metathorax the conical setae may number only one or two in each cerarius surrounded by five or six trilocular pores. On the head the setae and trilocular pores comprising the cerarii are reduced in number posteriorly. Dorsal setae numerous, all short and slender, a few larger setae present on the posterior abdominal segments. Trilocular pores abundant, evenly distributed. Dorsal multilocular disc pores and tubular ducts absent.

Ventral surface of the body with a small area of sclerotization on the inner angles of each anal lobe. Ventral setae not as numerous as on dorsum, longer on the posterior abdominal segments. Short slender setae distributed over thorax and head. Multilocular disc pores confined to the mid-region of the body. A group of about 25 situated posterior to the vulva and about 50 in a transverse row on each of the first two prevulvar segments. Ventral tubular ducts of two sizes confined to the posterior abdominal segments. A larger type present in characteristic single groups of 20–30 on the margins of the seventh, and eighth segments. One or two are also present in the mid-region of the seventh segment. The smaller type situated in transverse rows on the mid-region of the sixth and seventh segments, around the groups of the larger type and on the margins of the anal lobes. Trilocular pores not so abundant as on dorsum, rather numerous around the openings of the spiracles. A few simple circular pores present in no definite arrangement.

NOTES. Strickland (1947) has already drawn attention to the variable characters of *ritchiei* to which he synonymized *multispinosa*. The types of these two species have been seen and also the type of *anomala* Newstead and it is quite evident that both *ritchiei* and *multispinosa* are synonyms of *anomala* the latter species here placed in the genus *Paraputo* which was erected for *ritchiei* by Laing. Ferris (1955) has attempted to redefine the genus *Paraputo* and to redescribe *ritchiei*. Unfortunately both descriptions were based on immature specimens of *ritchiei*.

Pseudococcus obtusus Newstead = ***Rastrococcus iceryoides*** (Green)

This species was described from German East Africa on Baobunde and was later described from other localities in East Africa. Green (1922) synonymized it with his *iceryoides* and a further discussion is given under this name as assigned to the recent genus *Rastrococcus* Ferris.

Pseudococcus perniciosus Newstead & Willcocks = ***Nipaecoccus vastator*** (Maskell)

Originally described from Egypt this species has been recorded by James (1933) from Kenya on coffee. It was regarded as a synonym of *Pseudococcus filamentosus* Cockerell by Hall (1925) but recently Ferris (1948) established it to be a synonym of *vastator* Maskell discussed elsewhere in this work.

Pseudococcus perniciosus var. Newstead = ***Nipaecoccus vastator*** (Maskell)

Pseudococcus perniciosus var. Newstead, 1920, *Bull. ent. Res.* **10** : 178, 179.

This species was described by Newstead as possessing no typical abdominal cerarii except on the anal lobes and in this respect differed from typical *perniciosus*. An examination of the original material of this supposed variety shows that the cerarii are similar to typical *perniciosus* and also to *vastator* to which *perniciosus* is a synonym.

Pseudococcus virgata var. ***madagascariensis*** (Newstead) = ***Ferrisiana virgata*** Cockerell

As previously stated in this work this species has been synonymized with *Ferrisiana virgata* by Mamet (1951). An examination of the types of this species from Madagascar shows that there is no justification for accepting the variety and consequently all records to this species includng those by Newstead and Lindinger from Tanganyika and Newstead from Nigeria should be known under *virgata*.

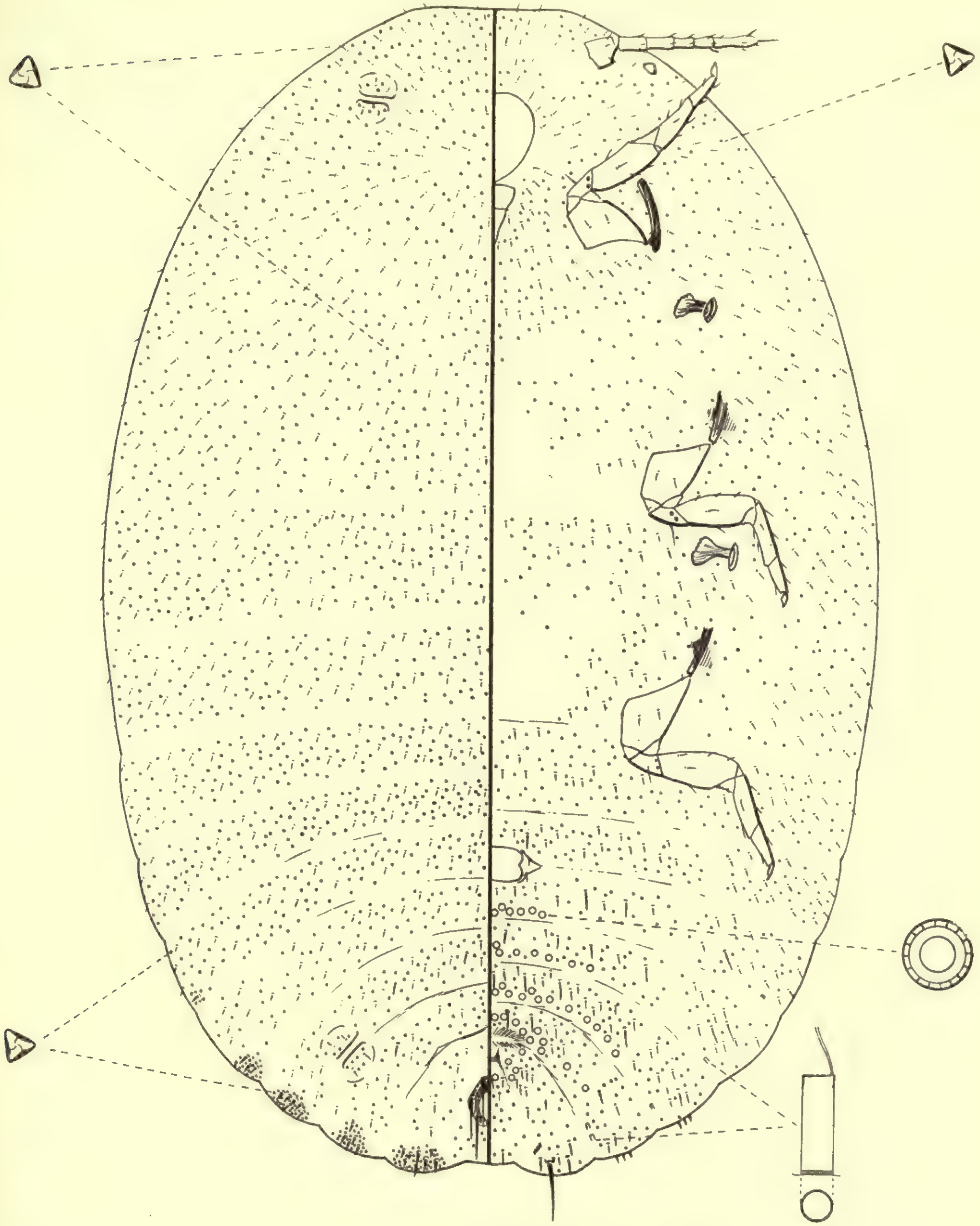
Ripersia glandulifera Newstead

(Text-fig. 5).

Ripersia glandulifera Newstead, 1912, *Denkschr. med.-naturw. Ges. Jena*, **17** : 17.

HABIT. Originally described from South West Africa, Klein-Namaland, Kamaggas on *Adiantum* sp. and collected by L. Schultze 1904. Apparently this is the only record. Newstead stated that no details could be given of the external covering.

RECOGNITION CHARACTERS. Adult female oval, a rather large species measuring approximately 3·4 mm. × 2·25 mm. on the slide. Antennae short, six-segmented. Legs short and slender but coxae noticeably large in proportion. Circulus present but on the two available specimens its shape cannot be determined with accuracy.



Text-fig. 5. *Ripersia glandulifera* (Newstead).

Ostioles well developed with two to three setae and three to six trilocular pores on each lip. Anal ring situated about its length from the posterior end of the body, with six setae slightly longer than the diameter of the ring. Cerarii reduced in number, there being five pairs present on the abdomen. Anal lobe cerarii each composed of eight or nine setae of various sizes but all are short, stout and conical, surrounded by numerous trilocular pores. The setae and trilocular pores comprising the other cerarii are reduced in number anteriorly, each anteriormost cerarius composed of one or two setae and about six trilocular pores. Dorsal setae rather numerous, short and slender, except for a few in the mid-region of the posterior abdominal segments which are stouter and larger. Trilocular pores numerous. Dorsal tubular ducts absent.

Ventral surface with a small area of sclerotization on each anal lobe and a curved area posterior to the vulva. Anal lobe setae stout, longer than anal ring setae, each surrounded by three or four setae of moderate length. Other setae of various lengths, mainly short and slender and interspersed on the abdomen with longer and stouter setae. Multilocular disc pores confined to the mid-region of segments posterior to the circulus, arranged in transverse rows on posterior edges of the prevulvar segments and in a group of about twelve pores posterior to vulva. Tubular ducts of one size, sparse, a single duct present on the margins of the fifth, sixth and seventh segments and a marginal group of two or three on the eighth segment. Trilocular pores evenly distributed, not so numerous as on the dorsal surface.

NOTES. Through the kindness of Dr. St. von Keler of the Zoologisches Museum, Berlin, it has been possible to see two adult females of this species. These are not in very good condition so that the illustration herewith must be regarded as tentative. When describing this species Newstead gave a diagram of the second stage female and gave characters of this and the larva. Specimens have been seen which show that these are referable to a species of *Pseudococcus*, they are quite distinct from *glandulifera*.

This species seems to be a *Paraputo* but is here left in the genus *Ripersia* until such time as all the African species relating to *Paraputo* can be studied.

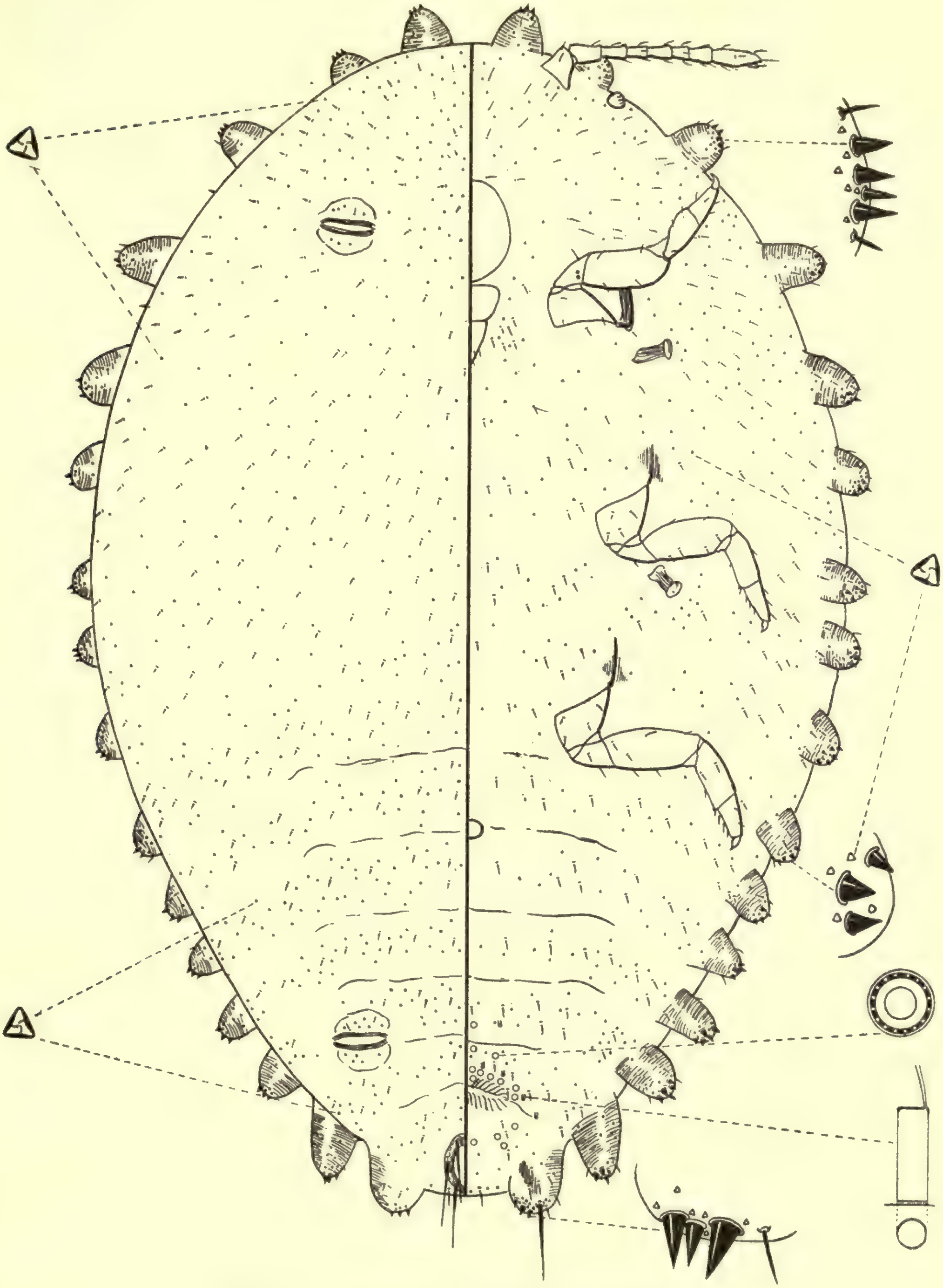
Tylococcus madagascariensis Newstead

(Text-fig. 6)

Tylococcus madagascariensis Newstead, 1897, *Ent. mon. Mag.* **33** : 166.

HABIT. Described originally from Madagascar in the nests of *Crematogaster Schenki* For. Newstead was not able to give any account of the external covering as the specimens had been preserved in alcohol. The species has apparently not been collected since the original discovery.

RECOGNITION CHARACTERS. Body of adult female ovoid, measuring approximately 2 mm. long. Antennae eight-segmented. Legs rather short and stout. Ostioles moderately developed, each lip with one or two setae and three or four trilocular pores. Anal ring with six setae which are slightly longer than the diameter of the ring. Circulus small. Cerarii numbering sixteen pairs, each cerarius borne at the



TEXT-FIG. 6. *Tylococcus madagascariensis* Newstead.

apex of a stout, sclerotized, marginal and more or less conical tubercle. These tubercles are slightly ventral in position and the cerarii are inclined to the ventral surface. Anal lobe cerarii each with three large conical setae surrounded by a few trilocular pores. The marginal tubercles are smallest on the thorax and anterior abdominal segments and the cerarii borne on these tubercles are each composed of from four to six conical setae and a few trilocular pores. The conical setae comprising the cerarii on the anterior abdominal segments and the thorax tend to be shorter and stouter than the others. A few auxiliary setae are often present with the cerarii but these are stouter than the others on the dorsal and ventral surfaces. Between some of the tubercles there is often a cerarius composed of a few slender setae and trilocular pores but these are not constant. Dorsal setae short and slender, not numerous. Trilocular pores sparse. Dorsal multilocular disc pores and tubular ducts absent.

Ventral surface of anal lobes with a pair of long anal lobe setae, these longer than the anal ring setae. Anterior to these setae there is an area of sclerotization on each lobe surrounded by about three setae. Multilocular disc pores confined to the three posterior abdominal segments, there being about three on the seventh segment and about twenty on the eighth segment arranged in two transverse rows at the anterior edges of the segment. Six to nine pores are present posterior to the vulva. Ventral tubular ducts sparse, there being but two or three in the mid-region of the seventh segment and about eight in a transverse row on the eighth segment. Trilocular pores not numerous. Ventral setae few, of various sizes but all short and slender.

NOTES. This species was originally described in the genus *Tylococcus* by Newstead and since then other species have been assigned to it. It seems possible, however, that many of these are not congeneric.

THE SPECIES DESCRIBED BY E. E. GREEN

Green described only *Ripersia longisetosa* from the Ethiopian Region but a number of his species orginally described from elsewhere have now been discovered here. It is interesting to note that many which he described from the Indian Region have been collected in recent years in East Africa ; an indication that others may yet be found.

Antonina indica Green = ***Antonina graminis*** (Maskell)

This species has been described from India and has been synonymized with *A. graminis* Maskell by Ferris (*in* Zimmerman, 1948). African records, therefore, will be found listed herein under *graminis*.

Centrococcus insolitus (Green)

Phenacoccus nivalis (Maskell), de Charmoy, 1899, *Proc. Soc. Amic. Sci.* : 42 (misidentification).
Phenacoccus insolitus Green, 1908, *Mem. Dep. Agric. India, Ent.* **2** : 25.
Phenacoccus insolitus Green, Newstead, 1911, *Mitt. zool. Mus. Berl.* (V) **2** : 164.
Tylococcus insolitus (Green), Brain, 1915, *Trans. roy. Soc. S. Afr.* **5** : 95.

Phenacoccus insolitus Green, 1922, *The Coccidae of Ceylon*, **5** : 390.
Phenacoccus insolitus Green, James, 1934, *Stylops*, **3** : 272.
Phenacoccus insolitus Green, Mamet, 1949, *Mauritius Inst. Bull.* **3** : 11.
Phenacoccus insolitus Green, Mamet, 1950, *Mém. Inst. sci. Madagascar*, **4** : 21.
Centrococcus insolitus (Green), Ferris, 1954, *Microentomology*, **19** : 54.

Originally described by Green from India on *Sida cordifolia* as having numerous erect hair-like glassy filaments. Recorded by Newstead on *Tabernaemontana* from Tanganyika and by James from Kenya on *Sida rhombifolia*. Brain recorded this species under *Tylococcus* from Cape Province, South Africa on *Hibiscus*. It has been recorded by Mamet on various hosts in Mauritius and he has recently recorded it from Madagascar. Ferris (1954) has discussed and illustrated this species and placed it in the genus *Centrococcus* Borkhsenius.

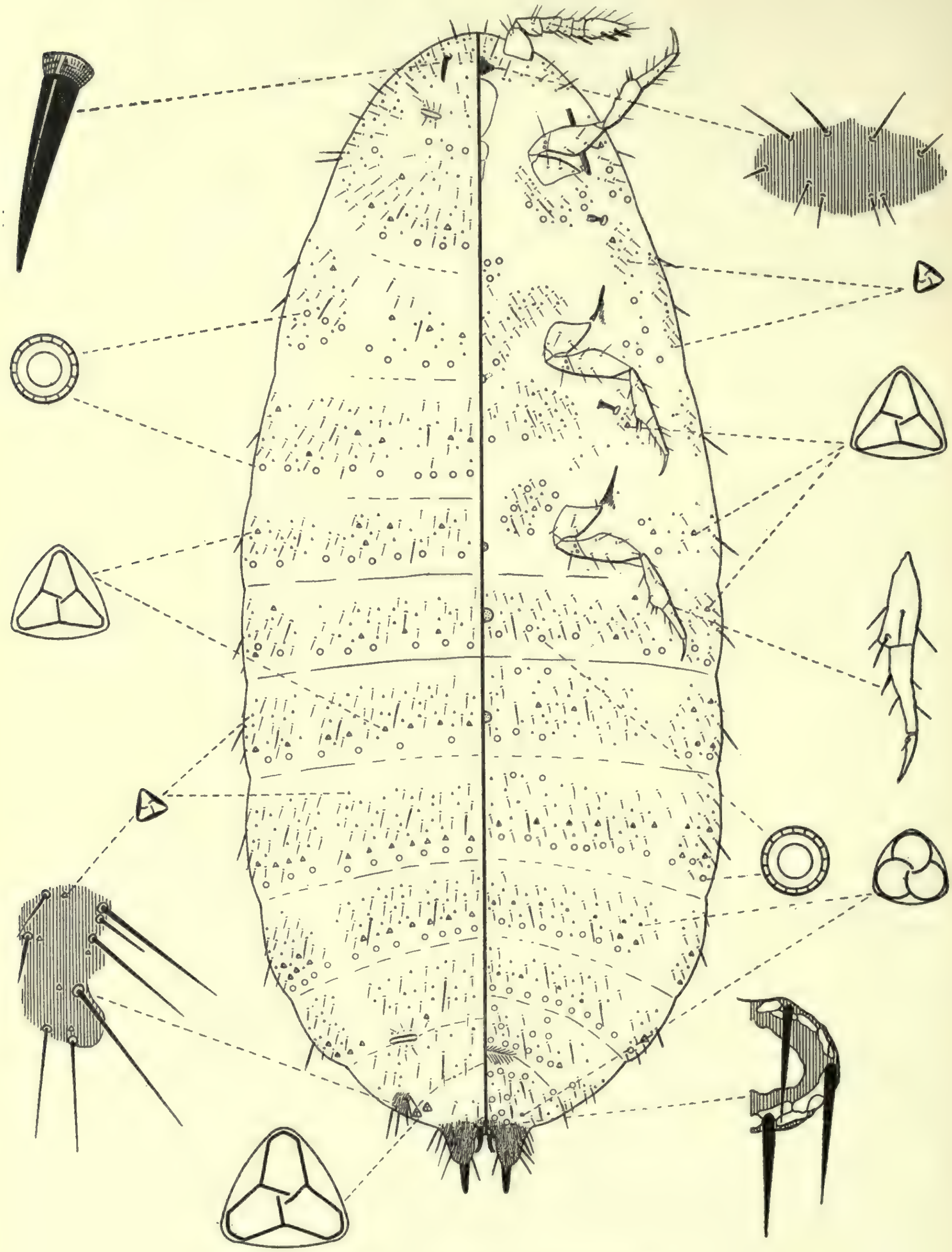
Geococcus coffeae Green

(Text-fig. 7).

Geococcus coffeae Green, 1933, *Stylops*, **2** : 54.
Geococcus coffeae Green, Strickland, 1947, *Bull. ent. Res.* **38** : 502.

HABIT. Originally described from Dutch Guiana from " the coffee tree (*C. liberica*) ". Recorded by Strickland (1947) from Gold Coast on the roots of *Theobroma cacao*, *Canna indica*, *Coffea arabica* and *Desplatzia dewevrei*. The habit of this species was not described by Green in his original description but Strickland described the habit in Africa as follows : " the insects form small cells, lined with white wax along the rootlets on which they are feeding ". The following description of the species is based on the type material, the specimens recorded by Strickland and on the following : Gold Coast, from soil, collected by W. Bellfield ; Ibadan, Nigeria, on the roots of *Canna indica*, collected by R. G. Donald and Zanzibar on the roots of clove, collected by M. J. Way.

RECOGNITION CHARACTERS. Body of adult female elongate-oval, the length of the older specimens attaining 2·5 mm. Antennae geniculate, six-segmented, the distal segment bearing a pair of stout, blunt setae. Legs small and slender, the distal end of tibia being noticeably wide. Claws long and slender, each bearing a pair of short, setose digitules at the base. Circuli three in number, situated on the second, third and fourth segments. They are rather small and convex, each with a reticulated surface, the anterior circulus being the smallest and the middle circulus being the largest. Dorsal ostioles well developed with the inner edges of the lips heavily sclerotized. Anal lobes heavily sclerotized and fused at the bases, each bearing at the apex a stout spine-like process nearly as long as a lobe. Between the bases of the lobes there is another pair of curved, blunt spine-like processes on the dorsal surface which are smaller than those on the apices of the lobes. A straight pair of similar processes is also present on the head, these set close together and situated just behind the antennae. The position of the spine-like processes between the anal lobes tends to push the anal ring to the ventral surface which always lies in this position on mounted specimens. Anal ring with six setae, the anterior pair being



TEXT-FIG. 7. *Geococcus coffeae* Green.

the shortest and most slender whilst the lateral pair is rather stout and longer than the others. The derm of the body tends to become more heavily sclerotized in the older females especially on the posterior abdominal segments and the head region which often masks the pore characters. Dorsal surface with cerarii entirely lacking. Setae of various lengths, rather numerous. On the posterior marginal angle of the ninth segment there are about five long setae and one or two smaller setae surrounding a more or less quadrate sclerotized area. Other long setae are present singly on the margins of the segments and about five to seven lie in transverse rows across each segment. The remaining dorsal setae are short and slender. Multilocular disc pores present on the head, thorax and posteriorly to the sixth abdominal segment, these lying in single transverse rows on the posterior edges of the segments. Trilocular pores interspersed with the setae, not numerous. Tritubular pores of two sizes, the most numerous having a single loculus about the same size as a trilocular pore, lying on all segments posterior to the seventh abdominal segment where they are situated in single transverse rows just anterior to the multilocular pores. On the sixth and seventh segments there are usually some marginal groups of five or six. Larger tritubular pores are present in numbers of two to four on the margins of the ninth abdominal segment and occasionally there is one on each margin of the eighth segment. In some specimens these pores are noticeably larger than the other dorsal tritubular pores whilst in other specimens they are of a similar size.

Ventral surface with an ill-defined sclerotized area between the antennal bases beset with about eight marginal setae. Ventral setae of various lengths similar to those on the dorsum. A few long setae on the anal lobes and on the ninth segment. Other long setae in transverse rows of about four to six on the abdominal segments and in the mid-region between the coxae and antennae. More numerous smaller setae are present on all segments. Multilocular disc pores on the abdomen in transverse single rows on the posterior edges of the segments. A few on the anterior edges of some of the anterior abdominal segments and on the first prevulvar segment. A group of about sixteen present on the ninth segment. Other multilocular disc pores in the mid-region between and lateral to the coxae. Trilocular pores in similar numbers to those on the dorsum, sparse on the posterior segments. Tritubular pores of two sizes. One type similar to the smaller on the dorsal surface distributed as follows : there is a single pore usually present posterior to each spiracle and one or two on the head and thorax among the groups of setae. On the third, fourth and fifth segments there are usually a few anterior to the multilocular disc pores and on the margins. Posteriorly there is only a pair or so to each of the remaining prevulvar segments. A smaller type of tritubular pore with round loculi is present in single transverse rows on the sixth and seventh segments and a pair is usually present on the ninth segment anterior to the anal lobes. These pores are about the same size as a multilocular disc pore. In some specimens they may be replaced on the sixth segment by the larger type. Tubular ducts entirely absent.

NOTES. Some doubt was entertained by Green as to whether he was describing immature or adult specimens. Of the three specimens available from the type material two are adults and one is immature. Specimens from the penultimate instar differ mainly in possessing but two circuli instead of three as in the adult.

The distribution of the tritubular ducts seems to be somewhat variable. On the sixth ventral abdominal segment of the Gold Coast specimens the tritubular pores are of the larger variety but in other specimens examined including the type they are of the smaller variety with round loculi.

The identification of this species seems to have been confused in many cases with *Geococcus radicum* described by Green (1902) from Pundaluoya, Ceylon, on grass roots. The latter differs from *coffeae* in lacking the pair of spines between the anal lobes and possessing differently shaped tritubular pores. These have been figured by Green (1902, fig. 3b), the loculi being mainly oval in shape and lying sideways to the radii. In *coffeae* the main tritubular pores have the loculi radiating lengthwise from the centre. Green (1922) recorded *radicum* from Kandy, Ceylon, and labelled this material immature. In fact this material is identical with his adult *coffeae* described from Dutch Guiana although he noted in his description of the latter that it differed from the immature specimens of *radicum* (the Kandy material) in having the anal lobes more heavily sclerotized. This sclerotization varies with the specimens and is of little importance.

There are, however, some first-stage larvae with the type material of *radicum* and there are at hand some first-stage larvae of the Gold Coast specimens here regarded as *coffeae*. The spine-like processes at the apices of the anal lobes differ greatly in size in the two species. In *radicum* they measure ·034 mm. × ·004 mm. and in the Gold Coast specimens they measure 0·028 mm. × ·01 mm. Furthermore in each species there is a pair of dorsal tritubular pores opposite the posterior coxae. In *radicum* these pores resemble those of the adult and in the Gold Coast specimens they also resemble the main dorsal pores of the adult herein illustrated under *coffeae*. As already stated the pores of both species are different, the first stage larvae of both species being, therefore, quite distinct. The position now seems to be clear that the specimens collected by Green at Kandy, Ceylon are adults of *coffeae* and not immature specimens of *radicum*. As many records of *radicum* throughout the world seem to have been based on the so-called immature form it is evident that many of these should be referred to as *coffeae*.

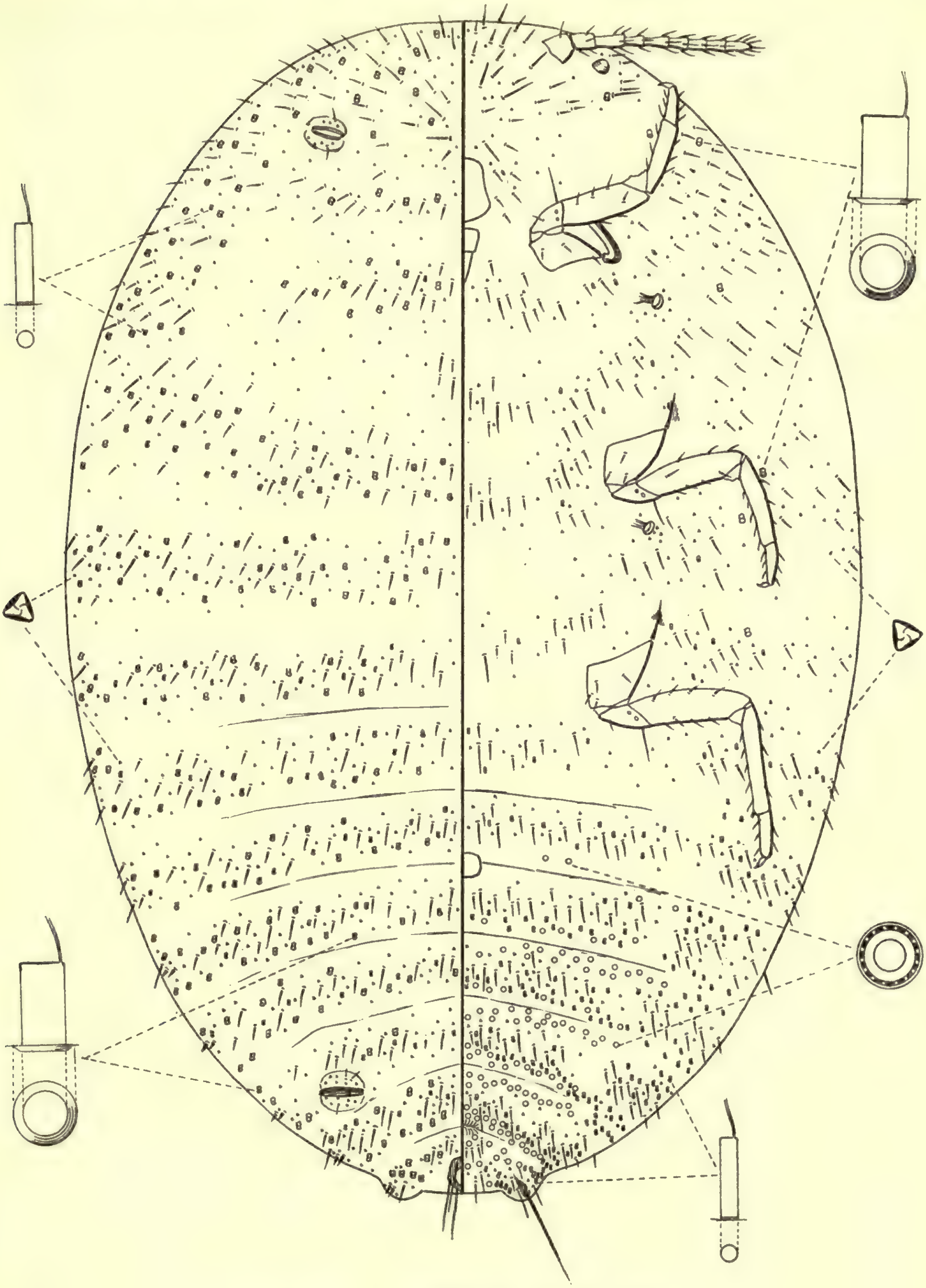
Phenacoccus hirsutus Green

(Text-fig. 8)

Phenacoccus hirsutus Green, 1908, *Mem. Dep. Agric. India, Ent.* **2** : 25.

HABIT. Described originally from India on an unknown shrub attended by ants (*Crematogaster rogenhoferi*) this species is now known to occur throughout the Indian Region and South East Asia. It is apparently established throughout the Middle East where it is known, especially in Egypt, on numerous hosts as the Hibiscus Mealy-bug often doing considerable damage. Specimens are at hand from numerous localities and hosts in Sudan. The species has been recorded as reddish in colour and sparsely covered with white mealy wax.

RECOGNITION CHARACTERS. Adult female ovoid, as mounted on the slide measuring approximately 3 mm. × 1·5 mm. Antennae nine-segmented. Legs slender of



TEXT-FIG. 8. *Phenacoccus hirsutus* Green.

moderate length, denticle on claw absent. Circulus small. Ostioles with a chitinized bar on the inner edge of each lip, and with one or two setae and a few trilocular pores. Anal ring with six setae which are a little longer than ring. Cerarii on the posterior five abdominal segments only. Anal lobe cerarii each composed of a pair of short conical setae and one or two trilocular pores. Anterior cerarii with two setae and rarely with trilocular pores. Dorsal setae numerous of various sizes but all slender. Dorsal multilocular disc pores absent. Tubular ducts of two sizes. Numerous large ducts of the oral rim type are distributed across each segment and small ducts each without an oral rim are located among the larger ducts but these are few in number. Trilocular pores sparse.

Ventral surface with a pair of long anal lobe setae which are about twice as long as anal ring setae. There is a narrow sclerotized bar extending from the base of each anal lobe seta. Ventral setae rather numerous of various sizes but all slender. Multilocular disc pores confined to the abdomen on the anterior and posterior edges of the segments posterior to the circulus. They tend to be more numerous at the anterior edges. Occasionally there are one or two pores on the first segment anterior to the circulus. Tubular ducts each with an oral rim and similar to those on dorsum, few in number and situated in a submarginal zone on the head and thorax. Small tubular ducts without the oral rim, numerous on posterior margins and lateral margins of the abdominal segments. They are sparse on the head and thorax. Trilocular pores few in number.

NOTES. Apart from the nine-segmented condition of the antennae this species has little to do with the genus *Phenacoccus*. The absence of the claw denticles, the presence of a sclerotized bar on each anal lobe and oral rim tubular ducts on the dorsal and ventral surfaces show close affinities to the genus *Paracoccus* Ezzatt & McConnell placed in the tribe Planococcini.

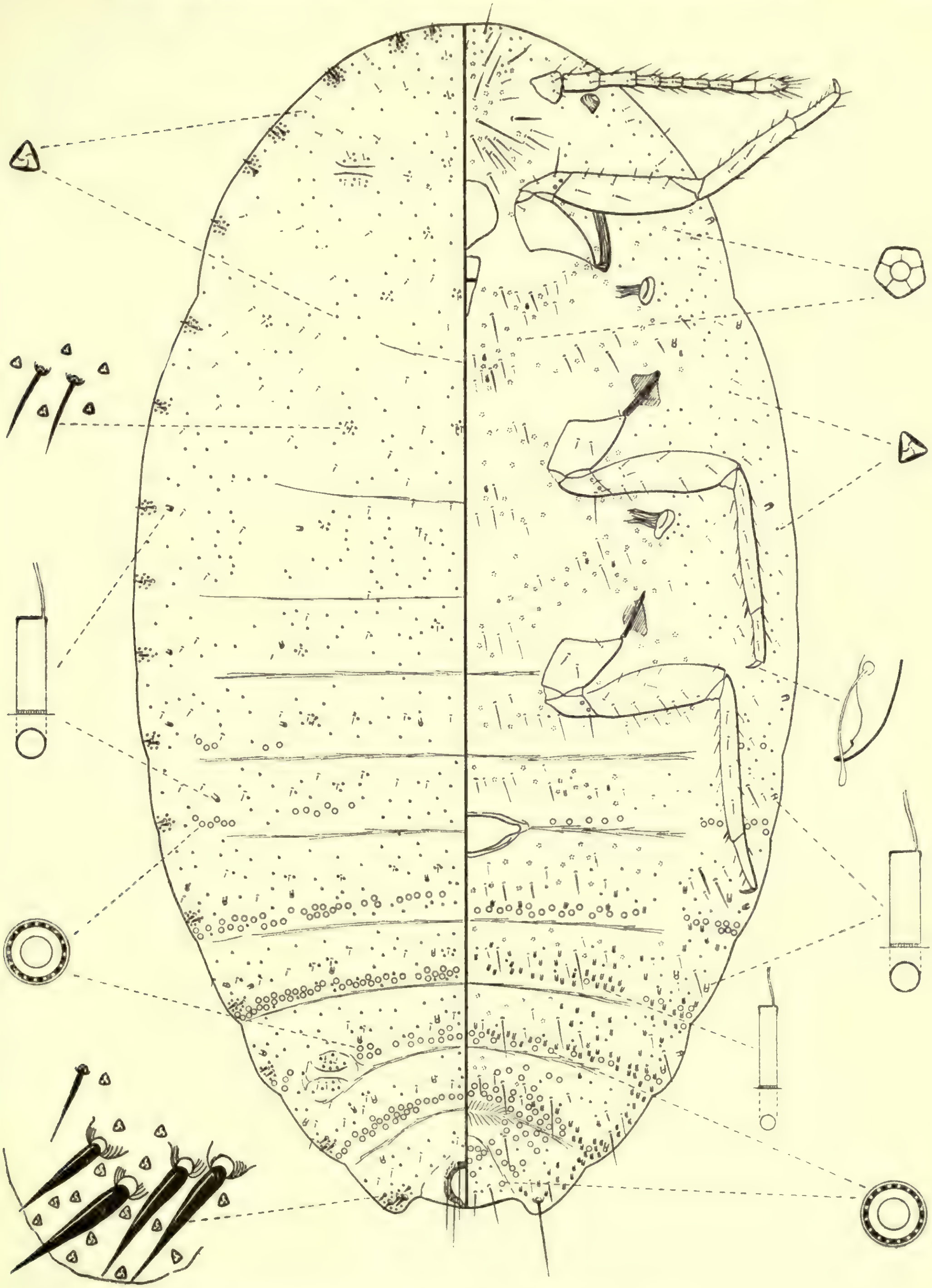
Phenacoccus madeirensis Green

(Text-fig. 9)

Phenacoccus madeirensis Green, 1923, *Bull. ent. Res.* **14** : 90, 91.

HABIT. Described originally from Funchal, Madeira on *Hibiscus rosa-sinensis*, *Sida* sp. and *Acalypha* sp. Specimens are at hand from Tafo, Gold Coast on *Hibiscus mutabilis*, Koforidua, Gold Coast on tomato and an ornamental shrub and from Ibadan, Nigeria on *Lantana*. Green states that the living insect is pale green, dusted with white mealy secretion, the ovisac being loose, white and of irregular form.

RECOGNITION CHARACTERS. Body of adult female elongate-oval, as mounted on the slide measuring approximately 2·5 mm. × 1·3 mm. Antennae nine-segmented. Legs long and slender, with a denticle on the plantar surface of the claw. Circulus large, narrowing laterally. Ostioles moderately developed, the posterior pair rather more so than the anterior pair. Anal ring with six setae which are a little longer than the diameter of the ring. Eighteen pairs of marginal cerarii present. Anal lobe cerarii each composed of five to six conical setae of various sizes, surrounded by a cluster of trilocular pores. Penultimate cerarius with three conical setae, the anterior



TEXT-FIG. 9. *Phenacoccus madeirensis* Green.

cerarii with two setae except the preocular cerarius with three setae and each ocular cerarius with four setae. Dorsal setae sparse, all slender and small. Dorsal cerarii present on thorax and head, these not numerous and each composed of one or two setae surrounded by four or five trilocular pores, the setae being slender and similar to the others on the dorsal surface. Dorsal multilocular disc pores on the posterior edges of the third to eighth abdominal segments only. On the third and fourth segments these pores are situated in single transverse rows and not present in the mid-region. On the posterior segments the disc pores are numerous in double transverse rows. Tubular ducts of one size, few in number and arranged transversely on the thoracic and abdominal segments. Trilocular pores sparse and evenly distributed.

Ventral surface with a pair of long, stout, anal lobe setae, these nearly twice as long as anal ring setae. Other ventral setae sparse, of various lengths, the longest present on the abdomen and between the antennae. Multilocular disc pores situated on the abdomen only. There are groups of submarginal pores from the third to eighth segments and those in the middle of the segments are distributed as follows : on the fourth segment, four or five are located on either side of the circulus, on the fifth segment there is a double transverse row but only one or two pores are present on the sixth segment. A single row present on the seventh segment, these and the anterior pores, located on the posterior edges of the segments. A transverse group on the first prevulvar segment and also groups on the anterior edge of the segment. Other groups posterior to the vulva. Quinquelocular pores on all segments anterior to the vulva, situated in the mid-region, where they are more abundant on the thorax and between the antennae. On the abdomen they occupy the anterior region of each segment. Ventral tubular ducts of two sizes, the larger ducts of the same size as those on the dorsum and present in a submarginal zone, at the most only two or three to each segment. The smaller ducts are numerous and apart from a few in the mid-region of the thorax they are mainly confined to the posterior abdominal segments. On the sixth segment they replace the multilocular disc pores, and on the seventh segment they are more numerous than the multilocular disc pores and become more abundant laterally. They occupy submarginal positions on the eighth segment and are present on the anal lobes. Trilocular pores sparse, more numerous around the margins.

NOTES. This species comes close to *Phenacoccus franseriae* Ferris, described from Mexico, in having dorsal cerarii and a similar distribution of multilocular disc pores. In *franseriae* the dorsal cerarii are more numerous on the thorax and abdomen but in *madeirensis* these cerarii are more numerous on the head and thorax. The anal lobe cerarii of *madeirensis* are each composed of about five setae whilst in *franseriae* the setae are in pairs.

Pseudococcus cannae Green = ***Dysmicoccus brevipes*** (Cockerell)

Pseudococcus cannae Green, 1934, *Stylops*, **3** : 162.
Pseudococcus cannae Green, Mamet, 1949, *Mauritius Inst. Bull.* **3** : 13.

As previously stated this species appears to come within the range of variation of *Dysmicoccus brevipes* (Cockerell) to which it is herein sunk as a synonym.

Pseudococcus citriculus Green

Pseudococcus citriculus Green, 1922, *The Coccidae of Ceylon,* **5** : 377.

Described by Green from Ceylon. Specimens are at hand from Zanzibar on *Citrus* and *Cocos nucifera* collected by M. J. Way. Material has been kindly made available by Dr. R. Mamet from Mauritius on various hosts. This species has been illustrated by Ferris (*in* Zimmerman, 1948) and Ferris (1954).

Pseudococcus gahani Green

Pseudococcus gahani Green, 1915, *Ent. mon. Mag.* **51** : 179.
Pseudococcus gahani Green, Joubert, 1928, *Bull. ent. Res.* **19** : 209.
Pseudococcus gahani Green, Ferris, 1950, *Atlas of Scale Insects of North America,* **5** : 180.

This species has been recorded by Joubert from South Africa on pear. It is possible that it is the same as *Pseudococcus fragilis* Brain described from South Africa on orange in which case *gahani* will have to be sunk as a synonym. It is expected that Mr. De Lotto will be dealing with the Brain species and a redescription of *Pseudococcus fragilis* will be given later. A diagram of *gahani* has recently been given by Ferris (1950).

Rastrococcus iceryoides (Green)

Phenacoccus iceryoides Green, 1908, *Mem. Dep. Agric. India, Ent.* **2** : 26.
Dactylopius (*Pseudococcus*) *obtusus* Newstead, 1911, *Mitt. zool. Mus. Berl.* (V) **2** : 164.
Dactylopius (*Pseudococcus*) *obtusus* Newstead, 1913, *Bull. ent. Res.* **4** : 68.
Phenacoccus obtusus (Newstead) Lindinger, 1913, *Jb. hamburg. wiss. Anst.* **30** : 67.
Phenacoccus iceryoides, Green, 1922, *The Coccidae of Ceylon,* **5** : 391.
Rastrococcus iceryoides (Green), Ferris, 1954, *Microentomology,* **19** : 55.

This species was originally described from India. In the Ethiopian Region it has been recorded only from Tanganyika and Zanzibar under the name *P. obtusus* Newstead. Green (1922) synonymized the latter with his *iceryoides.* Recently it has been redescribed and illustrated by Ferris (1954).

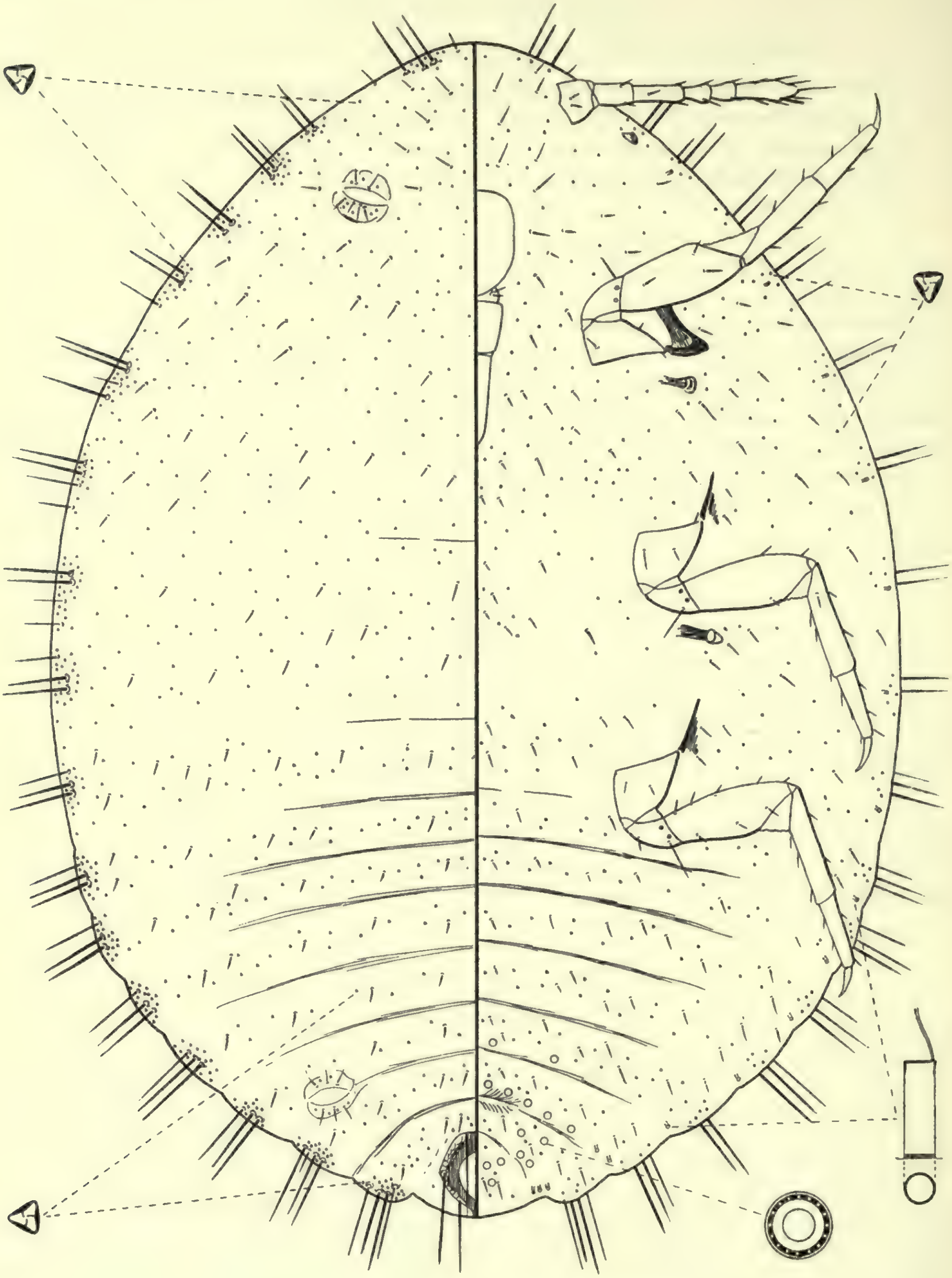
Ripersia longisetosa Green

(Text-fig. 10)

Ripersia longisetosa Green, 1924, *Bull. ent. Res.* **15** : 47, 48.

HABIT. Described by Green from Table Mountain 1,000 ft., South Africa in nests of an ant (*Plagioleps* sp.). Green gave no description of the external covering.

RECOGNITION CHARACTERS. Adult female broadly oval measuring approximately 1·2 mm. × 0·9 mm. on the slide and thus a rather small species. Antennae six-segmented. Legs normal, claws long and slender each with an extremely minute denticle. Circulus absent. Anterior and posterior ostioles well developed. Anal ring normal, with six setae. Cerarii numbering seventeen pairs of a distinctive type. Each cerarius composed of long, pointed setae about as long as the anal ring setae.



TEXT-FIG. 10. *Ripersia longisetosa* Green.

Anal lobe cerarii usually with two stout and two slender setae but all of similar length and surrounded by a cluster of trilocular pores. The anterior cerarii similar to anal lobe cerarii, each with one or two stout setae and one or two slender setae. Between some of the cerarii are often a few setae of a similar shape to those in the cerarii but these are shorter and not constant in position. Dorsal tubular ducts absent. Trilocular pores evenly distributed, not numerous. Dorsal setae sparse and of moderate length.

Ventral surface without sclerotization on the anal lobes. Anal lobe setae about the same size as the long cerarian setae. Multilocular disc pores not numerous, present on the seventh and posterior segments only and numbering about thirty altogether, those on the two prevulvar segments in single transverse rows. Tubular ducts few, of one size and arranged singly on the margins of the segments except on the eighth segment and the anal lobes where there are groups of two to three ducts. Trilocular pores sparse. Setae of various sizes but all slender and not numerous.

NOTES. The distinctive features of this species are the unusually long setae of the cerarii combined with the six-segmented antennae and the few multilocular disc pores. The description is based on two type slides each containing four specimens. Except for one or two specimens the cerarian setae have been completely broken off at the bases. The species cannot be placed with certainty in any known genus. The denticle on each claw is hardly perceptible, as was noted by Green in his original description, and in some claws it is not discernible.

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BRITISH MUSEUM
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NATURAL HISTORY

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ORDERS ODONATA, NEUROPTERA AND TRICHOPTERA

D. E. KIMMINS

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BY

D. E. KIMMINS xref.

Pp. 237–250 ; 6 *Text-figures*

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MISS L. E. CHEESMAN'S EXPEDITION TO NEW HEBRIDES, 1955. ORDERS ODONATA, NEUROPTERA AND TRICHOPTERA

By D. E. KIMMINS

MISS CHEESMAN's collections (as far as these three orders are concerned) were made chiefly on the island of Aneityum. Two main localities were worked, one on the coast at Anelgauhat and the other at Red Crest, 1,200 ft., three miles north-east of Anelgauhat. She also carried out some further collecting in New Caledonia. The material was not extensive but included examples of three new species. Nine species of Odonata, seven of Neuroptera and four of Trichoptera were collected, of which six from New Hebrides and one from New Caledonia had not been previously recorded.

I am taking the opportunity, at the conclusion of this paper, to give a list of the species of Odonata, Ephemeroptera, Neuroptera and Trichoptera recorded from New Caledonia, the Loyalty Islands and New Hebrides. Out of nearly eighty identified species and subspecies, no less than thirty-three are endemic to one or more of these groups of islands.

ODONATA

Family COENAGRIIDAE

Agriocnemis exsudans (Selys)

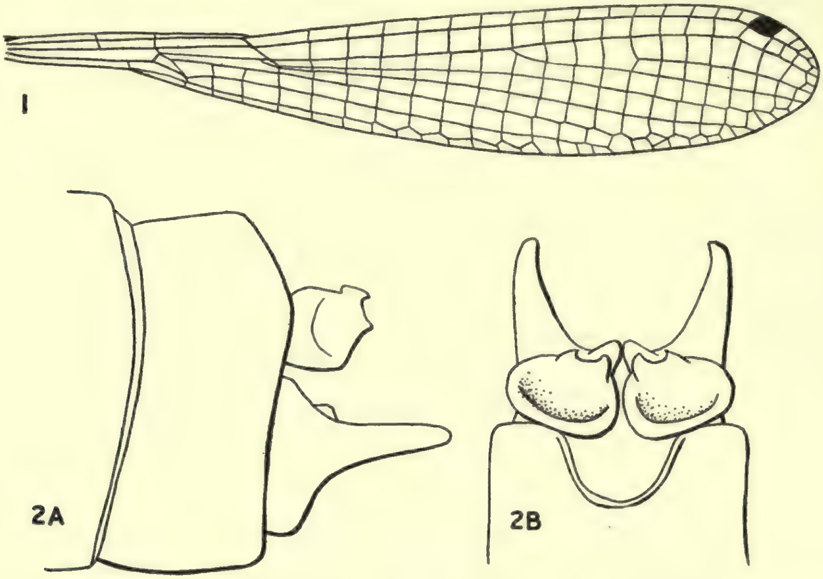
Aneityum, Anelgauhat, vi–vii.1955, numerous examples.
DISTRIBUTION. New Caledonia, New Hebrides, Fiji and Samoa.

Nesobasis bidens sp. n.

(Text-figs. 1–2)

Aneityum, Red Crest, 1,200 ft., vi.1955, 1 ♂.

Labium yellowish, labrum yellowish brown, with a small brown spot at the centre of its basal margin. Clypeus with a brown T-mark on a yellowish ground. Head black, between the antennae fulvous. Antennae dark fulvous. Pronotum black, its lateral margins yellowish. Synthorax with a median, dorsal, black band, which is slightly metallic, reaching the humeral suture in its upper fourth, but elsewhere is separated from it by a narrow yellowish band. Synthorax laterally yellowish, marked with fuscous on the mesinfraepisternum, and with two short lines on the mesepisternum above, on the lateral sutures. Legs yellowish brown, apices of femora finely bordered with fuscous, the basal inner surface of anterior tibia also fuscous ; spines black. Wings hyaline, pterostigma greyish black ; fifteen postnodals in anterior and thirteen in posterior wing.



FIGS. 1–2. *Nesobasis bidens* sp. n. ♂. (1), fore wing ; (2A), anal appendages, lateral ; (2B) anal appendages, dorsal.

Abdominal segments I–II greenish black above, pale yellowish on sides. Segments III–VII greenish black above, each with a pair of small, yellowish spots at their bases, almost meeting dorsally. In side view the dorsal black extends downwards at apices of segments III–VI and to a greater extent on segment VII. Segment VIII bluish black, with the exception of a narrow pale line on lower lateral border. Segment IX bluish white above, in side view with its lower lateral third blackish. Segment X almost entirely bluish white.

Superior anal appendages blackish brown, outer angles paler ; short, from above broad and ovate, inner angle higher than outer ; upper surface slightly concave, its apical margin with two small, acute, shiny black teeth, one at the inner apical angle, the other just before the middle of the apical margin. In side view the inner tooth appears as an elevated knob. Inferior anal appendages about twice as long as superior, blackish, with pale yellowish bases. In lateral aspect broad at base, abruptly narrowed to an acute apex. From above, appendage is only slightly incurved.

Length of abdomen, 25 mm., of hind wing, 22·5 mm.

♂ holotype in British Museum (Nat. Hist.). The single male is perhaps a little teneral and the areas described above as yellowish are possibly greenish or bluish when mature. *N. bidens* may be distinguished from the other New Hebridean species (*malekulana*) by the bidentate apical margin of the superior anal appendage and by the almost straight inferior anal appendage.

Family AESHNIDAE

Aeshna brevistyla Rambur

Aneityum, Red Crest, 1,200 ft., i–ii.1955, 1 ♀.
DISTRIBUTION. Australia, New Zealand, Loyalty Islands.

Anaciaeshna jaspidea (Burmeister)

Aneityum, Red Crest, 1,200 ft., i–ii.1955, 1 ♂.
Aneityum, Anelgauhat, vii.1955, 1 ♂, 3 ♀.
Widely distributed from India to Tahiti.

Family CORDULIIDAE

Hemicordulia fidelis McLachlan

Aneityum, Red Crest, 1,200 ft., i–ii.1955, 3 ♂, 2 ♀
Aneityum, Anelgauhat, i, vi.1955, 3 ♂.
DISTRIBUTION. New Caledonia, Loyalty Islands, New Hebrides. (The specimens recorded by me in 1936 as *Hemicordulia assimilis oceanica* from New Hebrides were mis-identified and should be *H. fidelis* McLachlan).

Family LIBELLULIDAE

Agrionoptera insignis lifuana Kimmins

Aneityum, Anelgauhat, ii.1955, 1 ♂.
Aneityum, Red Crest, 1,200 ft., vi.1955, 1 ♂.
DISTRIBUTION. Loyalty Islands, New Hebrides.

Orthetrum caledonicum (Brauer)

Aneityum, Red Crest, 1,200 ft., i–ii, v–vii.1955, 2 ♂, 2 ♀.
DISTRIBUTION. New Caledonia, New Hebrides, Australia.

Pantala flavescens (Fabricius)

Aneityum, Red Crest, 1,200 ft., vi.1955, 1 ♂, 1 ♀.
Aneityum, Anelgauhat, vii.1955, 4 ♂, 1 ♀.
DISTRIBUTION. Circumtropical.

Trapezostigma limbata (Desjardins)

Aneityum, Anelgauhat, vii.1955, 2 ♂.
Widely distributed.

NEUROPTERA

Family HEMEROBIIDAE

Nesomicromus navigatorum (Brauer)

Aneityum, Red Crest, 1,200 ft., v–vi.1955, 2 ♂, 2 ♀.
Widely distributed in Eastern Asia and Polynesia.

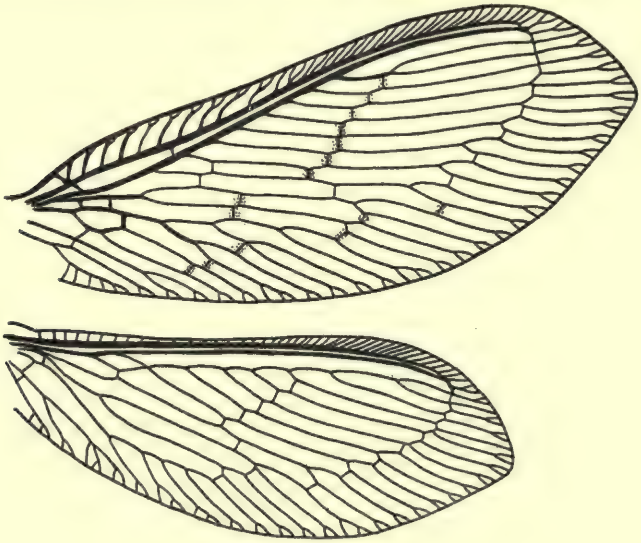


FIG. 3. *Noius noumeanus* sp. n. ♂ Wings.

Nesomicromus tasmaniae (Walker)

Aneityum, Red Crest, 1,200 ft., vi.1955, 2 ♂.
DISTRIBUTION. New Zealand, Tasmania, Australia, New Hebrides.

Noius noumeanus sp. n.

(Text-figs. 3–4)

NEW CALEDONIA: Nouméa, xi.1955, 1 ♂.

General coloration of body fuscous, without conspicuous markings, antennae and legs a little paler. Membrane of wings pale smoky hyaline, venation pale fuscous. In fore wing, the veins are interrupted with dull luteous, some cross-veins in the centre of the wing being shaded with fuscous. Costal margin of the fore wing slightly sinuous, apex of wing bluntly pointed. R_1 with eight branches, longitudinal veins unforked beyond the outer gradate series (apart from the marginal forks). *M* forking slightly basad of the basal branch from R_1, not bent towards *Cu*. In hind wing, *M* is only slightly bent towards *Cu*.

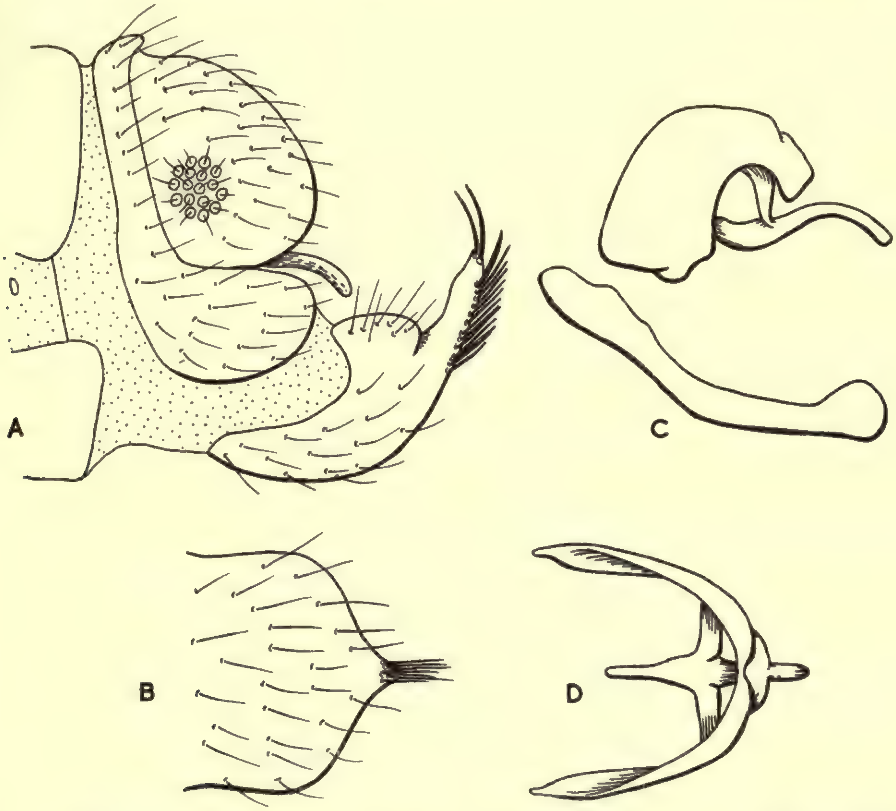


FIG. 4. *Noius noumeanus* sp. n. ♂ Genitalia. (A), lateral ; (B), ninth sternite, ventral ; (C), gonarcus and parameres, lateral ; (D), the same, dorsal.

♂ GENITALIA. Ninth tergite short, its ventral margins extended caudad in rounded lateroprocessi beneath the ectoprocts. Ninth sternite broad, its apex tapering to an upcurved finger armed with a row of stout spines. Upper basal angles of ninth sternite forming rounded, hairy domes. Lateral lobes of gonarcus broad, narrowing to a quadrate apex in side view. Arcessus slender, sinuously curved, attached to gonarcus by a pair of wings. Parameres fused basally, apices slightly divergent and clavate in side view. Ectoprocts broad, rounded apically, without processes.

Length of fore wing, 8 mm.

♂ holotype (abdomen mounted as a microscope preparation) in British Museum (Nat. Hist.). This species has been placed in the genus *Noius* Navás on the similarity of the venation of the basal part of the fore wing to Navás' figure. The wide area between M and Cu_1 is very noticeable and at once separates this species from *Nesomicromus*, which it much resembles in general appearance. It is of course possible that *noumeanus* may be synonymous with the type-species *oceanicus* Navás from Fiji, but as the type specimen of the latter was presumably destroyed by fire in the Hamburg Museum during the second world war, the identity of *oceanicus* must remain uncertain until more material from Fiji is available. The ♂ genitalia of *noumeanus* are also different in type from those of *Nesomicromus*, the ectoprocts lacking any hooked processes and the spiny ridge on the apex of the ninth sternite is also unusual. In the venation, the absence of any but the extreme marginal furcations beyond the gradate series is a good character.

Family CHRYSOPIDAE

Chrysopa otalatis Banks

Aneityum, Red Crest, 1,200 ft., vi.1955, 2 ♂, 2 ♀.
Aneityum, Anelgauhat, vii.1955, 7 ♂, 4 ♀.
Widespread in the Pacific islands.

Chrysopa basalis Walker

NEW CALEDONIA: Nouméa, xi.1955, 6 ♂, 7 ♀.
Widespread in the Pacific.

Chrysopa maculithorax Kimmins

Aneityum, Red Crest, 1,200 ft., v–vii.1955, 7 ♀.
NEW CALEDONIA: Nouméa, xi.1955, 2 ♂, 3 ♀.
DISTRIBUTION. New Hebrides, New Caledonia.

Chrysopa armstrongi Esben-Petersen

Aneityum, Red Crest, 1,200 ft., vi.1955, 1 ♀.
DISTRIBUTION. Samoa, New Hebrides.

TRICHOPTERA

Family RHYACOPHILIDAE

Apsilochorema cheesmanae sp. n.

Aneityum, Red Crest, 1,200 ft., vi.1955, 4 ♂, 8 ♀.

♂. Head fuscous, with golden hairs, palpi pale fuscous. Antenna with fuscous basal segment, then with a few golden yellow segments, shading off to fuscous. Thorax fuscous, with golden hairs. Abdomen fuscous. Fore wing with fuscous pubescence, mottled with patches of golden hairs, the upstanding hairs on the veins piceous. Membrane piceous with whitish areas at base and apex of stigma, at fork of *Rs*, along the outer margin of the wing-fold and above the arculus. Anal veins with yellowish patches. Hind wing smoky hyaline, with sparse fuscous pubescence. Venation of fore wing resembling that of *A. rossi* Kimmins, a weak cross-vein in costal area, fork M_1 about as long as its footstalk. In hind wing, forks R_4, M_1 and Cu_{1a} are present.

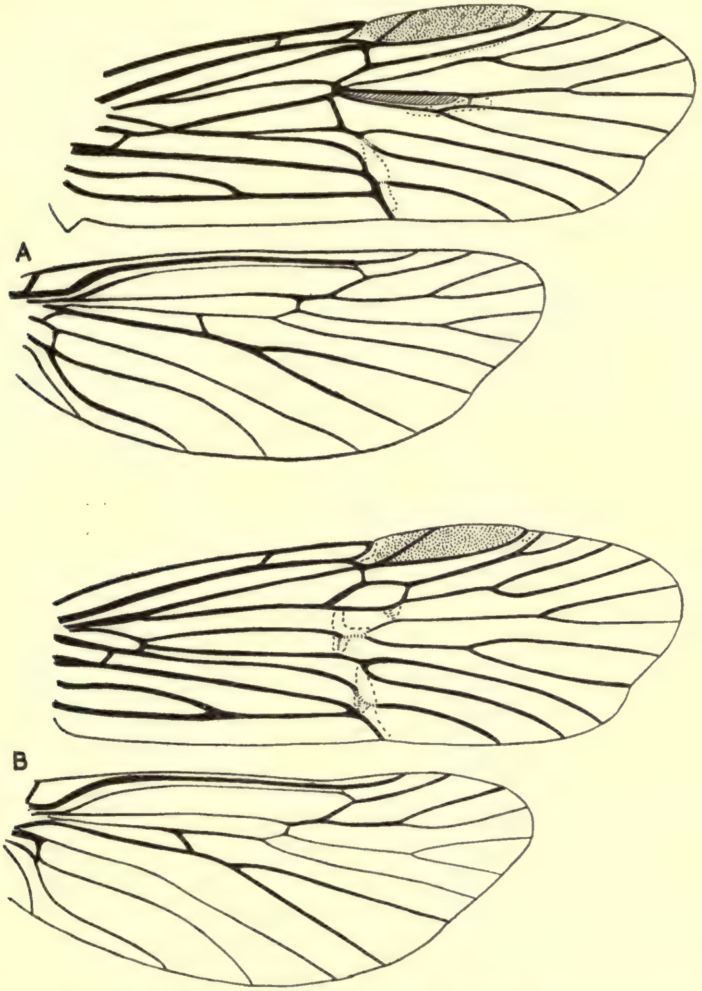


FIG. 5. *Apsilochorema cheesmanae* sp. n. Wings. (A), ♂; (B), ♀.

♂ GENITALIA. Lateral filaments to the fifth sternite, seventh sternite with a short, stout, pointed ventral process. Ninth segment narrowed dorsally to a slender transverse band at base of tenth segment. The median lobe of the latter is produced in a laterally compressed hood, deep at the base, its upper margin concave, apex with a pair of small setiferous lobes. Lateral lobes of the tenth segment as long as the median, forming stout, gently arched spines, each with an acute apex armed with a few stout setae. Cercus slender, less than half as long as median lobe. Aedeagus short, cylindrical. Clasper from the side moderately stout, slightly upcurved, apex rounded, upper margin humped about mid-way. In ventral view, the clasper tapers to a slender, rounded apex. From about mid-way, on its inner surface, arises a slender, mesally directed finger, its apex hooked.

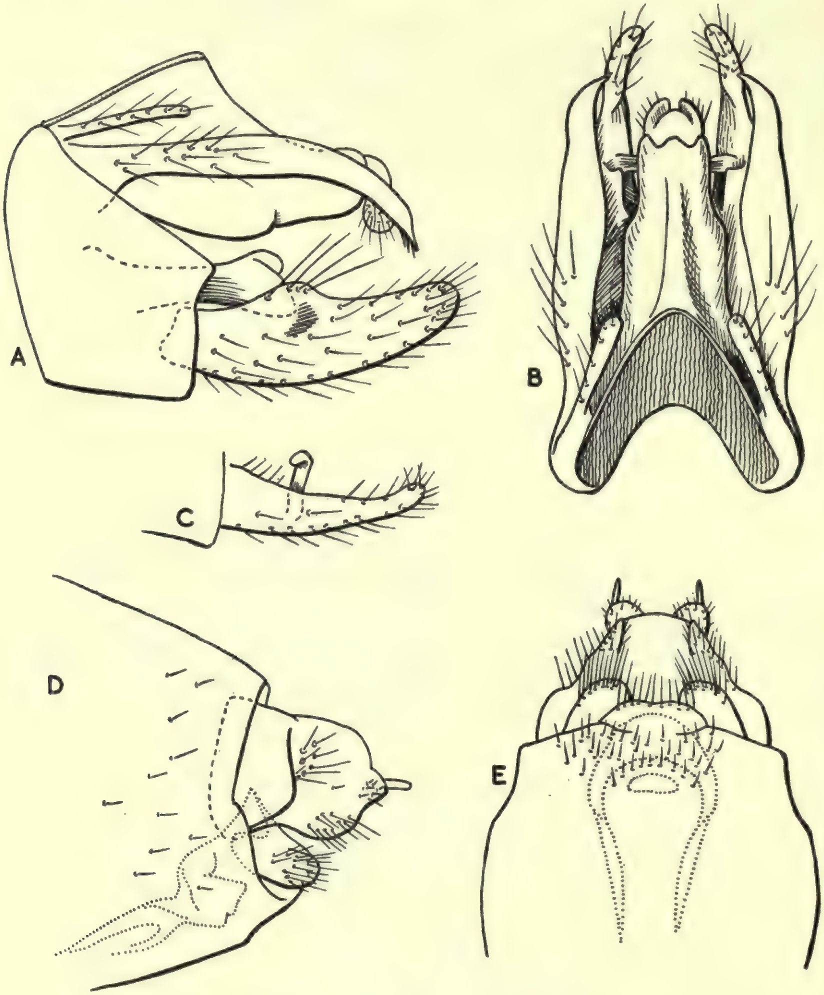


Fig. 6. *Apsilochorema cheesmanae* sp. n. Genitalia. (A), ♂, lateral; (B), ♂, dorsal; (C), ♂ right clasper, ventral; (D), ♀, lateral; (E), ♀, ventral.

♀. Fore wing with forks R_2, R_4, M_1, M_3 and Cu_{1a} present. An additional cross-vein present in the costal area. Fork M_3 shorter than in the male. In the hind wing, forks R_4, M_1 and Cu_{1a} present as in male.

♀ GENITALIA. Sixth sternite with a short ventral process, its apex rounded in ventral view. Eighth segment forming a complete ring, apical ventral margin produced in a small transverse lobe at its centre. Ninth segment short, lateral gonapophyses forming short, rounded, hairy lobes. Tenth segment fused to ninth and a little longer than the latter, bearing two short slender cerci, arising from globular bases.

Length of fore wing, ♂, 5·5 mm., ♀, 6 mm.

♂ holotype, ♀ allotype (in form of microscope preparations) and paratypes in British Museum (Nat. Hist.). This species is related to *A. rossi* Kimmins from Guadalcanal. The claspers are more upcurved in side view, their lower margins convex, and the tenth segment is relatively longer.

Family PSYCHOMYIDAE

Ecnomus sp.

Aneityum, Red Crest, 1,200 ft., 27.iii, v.1955, 2 ♀.

It is possible that these females may belong to the species *atratus* Mosely, described from Erromanga, but in view of the difficulty of associating female specimens of *Ecnomus*, it seems wiser not to attempt it.

Family LEPTOCERIDAE

Triplectides latipennis Mosely

Aneityum, Red Crest, 1,200 ft., v–vi.1955, 3 ♂, 4 ♀.

Previously recorded from Erromanga.

Family SERICOSTOMATIDAE

Goëra vunida Mosely

Aneityum, Red Crest, 1,200 ft., vi.1955, 5 ♂, 12 ♀.

These specimens have the wings somewhat darker than in the type (from Fiji), which is possibly faded, but there are no significant differences in the male genitalia.

List of Species and Subspecies of Odonata, Ephemeroptera, Neuroptera and Trichoptera Recorded from New Caledonia, Loyalty Islands and New Hebrides

ODONATA	New Caledonia	Loyalty Islands	New Hebrides	Other distribution
LESTIDAE				
Austrolestes cheesmanae Kimmins	×	—	×	—
MEGAPODAGRIIDAE				
Argiolestes ochraceus Montrouzier	×	—	—	—
A. sarasini Ris	×	—	—	—
A. uniseries Ris	×	—	—	—
Trineuragrion percostale Ris	×	—	×	—

ODONATA	New Caledonia	Loyalty Islands	New Hebrides	Other distribution
PROTONEURIDAE				
Isosticta robustior Ris	×	×	—	—
I. spinipes Selys	×	×	—	—
I. tillyardi Campion	×	—	—	—
COENAGRIIDAE				
Ischnura aurora (Brauer)	×	—	—	Ceylon to Tahiti.
I. heterosticta (Burmeister)	×	—	—	Fiji, Australia.
I. torresiana Tillyard	×	—	×	Queensland, New Guinea.
Agriocnemis exsudans Selys	×	—	×	Fiji, Samoa.
Nesobasis malekulana Kimmins	—	—	×	—
N. bidens Kimmins	—	—	×	—
Pseudagrion microcephalum (Rambur)	—	—	×	India to Australia.
Xanthagrion erythroneura Selys	×	—	—	Australia.
Xiphiagrion cyanomelas Selys	—	×	—	Indonesia, Papua.
AESHNIDAE				
Anax guttatus (Burmeister)	—	—	×	E. Asia to Australia.
A. gibbosulus (Rambur)	×	—	—	Australia.
Anaciaeschna jaspidea (Burmeister)	—	—	×	India to Tahiti.
Aeshna brevistyla Rambur	×	×	×	Australia, New Zealand.
Acanthagyna dobsoni Fraser (= *rosenbergi* Selys *partim*)	×	—	×	Queensland.
CORDULIIDAE				
Synthemis flexicauda Campion	×	—	—	—
S. fenella Campion	×	—	—	—
S. miranda Selys	×	—	—	—
S. montaguei Campion	×	—	—	—
Metaphya elongata Campion	×	—	—	—
Hemicordulia fidelis McLachlan	×	×	×	—
H. australiae (Rambur)	—	—	×	Australia.
H. oceanica Selys	×	—	—	Pacific.
LIBELLULIDAE				
Agrionoptera insignis allogenes Tillyard	×	×	—	Australia.
A. i. lifuana Kimmins	—	×	×	—
Orthetrum sabina (Drury)	—	—	×	Asia to N. Australia.
O. caledonicum (Brauer)	×	×	×	Australia.
Diplacodes trivialis (Rambur)	—	—	×	Seychelles, India—Japan —Queensland—Fiji.
D. bipunctata (Brauer)	×	×	×	Oceania, N. Zealand, Australia.
D. haematodes (Brauer)	×	—	×	N. Guinea, Australia.
Neurothemis stigmatizans brahmina (Guérin)	—	—	×	N. Guinea, Solomons, etc.
Pantala flavescens (Fabricius)	×	—	×	Circumtropical.

ODONATA	New Caledonia	Loyalty Islands	New Hebrides	Other distribution
Rhyothemis graphiptera (Rambur)	×	—	—	Australia.
R. phyllis aequalis Kimmins	—	—	×	—
R. ph. apicalis Kirby	×	—	×	—
R. regia armstrongi Fraser	—	—	×	Samoa.
Trapezostigma löwii (Brauer)	?	—	—	Australia.
T. limbata (Desjardins)	×	?	×	Oceania, Australia, India, Africa.
EPHEMEROPTERA				
Leptophlebiidae				
?Atalophlebia sp.	×	—	—	—
Baëtidae				
Cloëon erromangense Kimmins	—	—	×	—
NEUROPTERA				
Ascalaphidae				
Suhpalacsa caledon McLachlan	×	—	—	—
Myrmeleonidae				
Eidoleon bistrigatus (McLachlan)	×	×	×	Australia, Oceania.
Formicaleon ?lentus (Walker)	—	—	×	—
Myrmeleon celebensis McLachlan	—	—	×	Malaya, Sumatra, Celebes, N. Guinea, Solomons.
M. neocaledonicus Navás	×	—	—	—
M. pictifrons Gerstaecker	—	—	×	Australia.
Hemerobiidae				
Nesomicromus navigatorum (Brauer)	×	—	×	Oceania, Australia.
N. tasmaniae (Walker)	—	—	×	N. Zealand, Tasmania, Australia.
Noius noumeanus Kimmins	×	—	—	—
Annandalia obliqua (Banks)	—	—	×	Queensland.
Notiobiella multifurcata Tillyard	×	—	—	Queensland.
Chrysopidae				
Synthochrysa cognata Kimmins	—	—	×	—
S. montrouzieri (Girard)	—	×	—	—
Italochrysa chloromelas (Girard)	×	—	×	Queensland, Solomons.
Austrochrysa samoana Esben-Petersen	—	—	×	Samoa.
Chrysopa innotata Walker	—	×	×	Australia, Samoa, Tonga.
C. remota Walker	—	—	×	Samoa, Ryu-kyu Is.
C. oceanica Walker	—	×	×	Hawaii, Samoa, Society Is.
C. otalatis Banks	×	—	×	Australia, Samoa, Marquesas.
C. basalis Walker	×	—	×	Widespread in Pacific.
C. maculithorax Kimmins	×	—	×	—

ODONATA	New Caledonia	Loyalty Islands	New Hebrides	Other distribution
C. matsumurae Okamoto	×	—	×	Japan.
C. armstrongi Esben-Petersen	—	—	×	Samoa.
C. noumeana Navás	×	×	—	—
Sencera scioneura Navás	—	—	×	Indonesia, Philippines.
Ankylopteryx pallida Banks	—	—	×	Australia.
TRICHOPTERA				
RHYACOPHILIDAE				
Apsilochorema cheesmanae Kimmins	—	—	×	—
Xanthochorema caledon Kimmins	×	—	—	—
PHILOPOTAMIDAE				
Hydrobiosella uncinata Kimmins	×	—	—	—
HYDROPSYCHIDAE				
Hydromanicus sp. ♀	×	—	—	—
Hydropsyche sp. ♀	×	—	—	—
Cheumatopsyche sp. ♀	×	—	—	—
Caledopsyche cheesmanae Kimmins	×	—	—	—
PSYCHOMYIDAE				
Ecnomus atratus Mosely	—	—	×	—
Ecnomus sp. ♀	—	—	×	—
LEPTOCERIDAE				
Triplectides latipennis Mosely	—	—	×	—
SERICOSTOMATIDAE				
Mecynostomella fusca Kimmins	×	—	—	—
Goëra vunida Mosely	—	—	×	Fiji.

ADDENDUM

Owing to a misplaced card in my index to Trichoptera, Mosely's species *Cheumatopsyche lesnei* was unfortunately overlooked and in consequence I have re-described this species as *Cheumatopsyche uncata* in *Bull. Brit. Mus. N. H., Ent.* **6** (1) : 11. Mosely described only the male, although he had both sexes, but in my paper both sexes are described. *Cheumatopsyche lesnei* (Mosely) has a spur formula 2.4.4 and has M and Cu_1 in the hind wing widely separated and should therefore not be placed in the genus *Synaptopsyche*, as suggested by Ulmer.

D. E. Kimmins, 6.xii.1957.

BRITISH MUSEUM
10 MAR 1958
NATURAL HISTORY

THE IDENTITY OF *STENOPSYCHE GRISEIPENNIS* McLACHLAN

(TRICHOPTERA, Family STENOPSYCHIDAE)

D. E. KIMMINS

BULLETIN OF
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ENTOMOLOGY Vol. 6 No. 10
LONDON: 1958

THE IDENTITY OF *STENOPSYCHE GRISEIPENNIS* McLACHLAN (TRICHOPTERA, Family STENOPSYCHIDAE)

BY

D. E. KIMMINS

Xiy.

Pp. 251–260 ; 8 *Text-figures*

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THE IDENTITY OF *STENOPSYCHE GRISEIPENNIS* McLACHLAN (TRICHOPTERA, Family STENOPSYCHIDAE)

By **D. E. KIMMINS**

THIS paper deals mainly with the identity of *Stenopsyche griseipennis* McLachlan, the type species of *Stenopsyche*, but records of the Stenopsychidae collected by Dr. R. Malaise during the Swedish Expedition 1934 to Burma and British India are also included.

It is with considerable reluctance that I re-open the much-discussed question of the identity of *Stenopsyche griseipennis* McLachlan, the type-species of the genus. My reason for so doing is that I am now in a position to study McLachlan's type specimen. His 1866 descriptions and figures were, for their time, adequate and he doubtless never imagined that the genus would eventually prove to include a large number of species. *S. griseipennis* was based on a single male, " Habitat in India orientali ", in his collection and later he added other specimens of *Stenopsyche* from Darjeeling, Assam and China.

In 1907 Ulmer figured as *griseipennis* the genitalia of a male from Baltistan and added Japan to its range, and subsequent authors gave as localities India, Sikkim, W. China, Siberia and Formosa. In July 1926, Ulmer returned to the problem and gave new figures and descriptions of the male genitalia, based on Chinese examples. In September of the same year Martynov produced a revision of the genus and gave figures and descriptions of his interpretation of *griseipennis*, based on examples from Korea, S. Ussuri, Manchuria and Altai. The Japanese form he described as *S. japonica* (subsequently synonymized with *S. marmoratus* Navás) and Ulmer's Baltistan male he placed in *S. himalayana*. Judging from a male from S. Ussuri, sent to Mosely by Martynov as *S. griseipennis*, his and Ulmer's 1926 interpretations represent allied but probably distinct species. Neither of these authors had seen McLachlan's type, which was then still in private hands and inaccessible.

In 1938, the British Museum (Nat. Hist.) acquired by purchase the McLachlan Collection and the Trichoptera were incorporated into the museum collections by Mr. M. E. Mosely. Upon his death in 1948, the Trichoptera were placed in my charge and one of the first tasks I undertook was the preparation of a card index of Trichoptera types. I found that our series of *S. griseipennis* contained no example labelled " Type " and as a temporary measure the index card was marked " Type not yet located ". Recently I made a thorough search in our collection, not only over the label *griseipennis* but also amongst other species of *Stenopsyche* and was finally rewarded by discovering, amongst *S. quadrilobata* Martynov, a male labelled " India " and " Stenopsyche griseipennis " in McLachlan's handwriting, and with a British Museum register number indicating that it was part of McLachlan's collection. This specimen agreed satisfactorily with the original descriptions, measurements and figures, the only discrepancy being the locality label " India ", not " India orientali ". I think that McLachlan knew that it had come from eastern India but had not labelled it more fully, lest it be mistaken for East Indies. There was no minute reddish " Type " label of the kind generally employed by McLachlan, but as these were usually the lowest label on the pin, it may possibly have become detached and lost. (I have found other undoubted McLachlan types without such a label.) I am quite satisfied that this specimen is the one which McLachlan had before him when describing *S. griseipennis*, and I have therefore labelled it as the type, recording this belief on my own determination label. I consider that Mosely was quite justified in associating this specimen with *S. quadrilobata* Martynov, which species therefore becomes a synonym of *S. griseipennis* McLachlan.

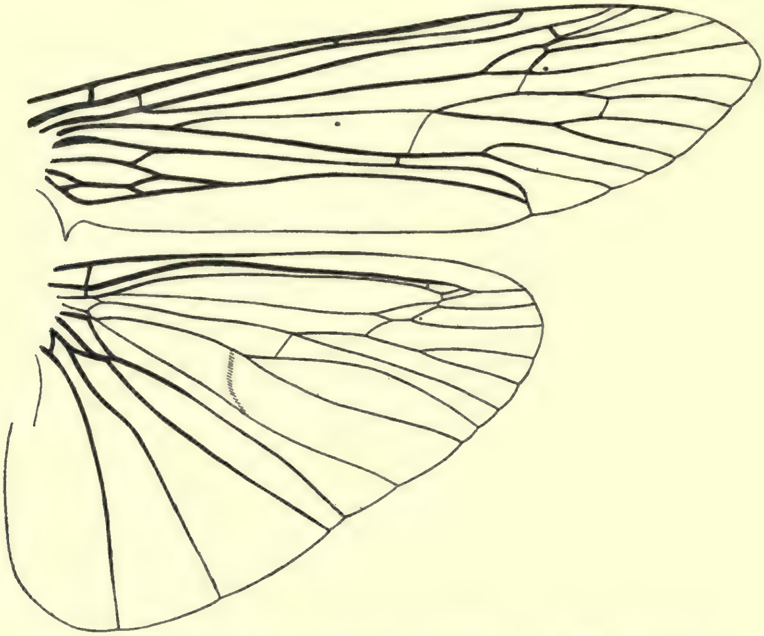

FIG. 1. *Stenopsyche griseipennis* McLachlan, ♂. Wings of type.

Stenopsyche griseipennis McLachlan

(Text-figs. 1–3)

Stenopsyche griseipennis McLachlan, 1866, *Trans. ent. Soc. Lond.* (3) **5** : 265–266, pl. 17, fig. 5 ; pl. 19, figs. 5*a–e*.

Stenopsyche quadrilobata Martynov, 1935, *Rec. Ind. Mus.* **37** : 131–132, fig. 36. **(Syn. nov.)**.

In view of the confusion which has arisen over the identity of this species, previous records of the distribution of *S. griseipennis* must be considered doubtful. I have seen examples from INDIA, United Provinces (Masuri), Punjab (Simla); SIKKIM (Phedong); N. BURMA (Mishmi Hills).

♂ GENITALIA (from type). Ninth segment reduced dorsally to a narrow, transverse band, side-pieces produced in slender, triangular lobes. Tenth segment more or less fused to ninth, extending about as far as apices of side-pieces, rather narrow, from above tapering to a four-lobed apex. The lateral margins about half-way are irregularly serrate, the serrations not amounting to processes. From the side, the upper surface is smooth. Cercus long, slender, digitate. Aedeagus with an expanded base and cylindrical stem, within which is an evertible membrane armed with numerous acute teeth or spines. Clasper bifid, its upper branch arising at the extreme base, forming a slender spine, curving upward and tailward, its apex bent outwards and acute. Lower branch flattened, a little shorter than the upper, its apex rounded in ventral view.

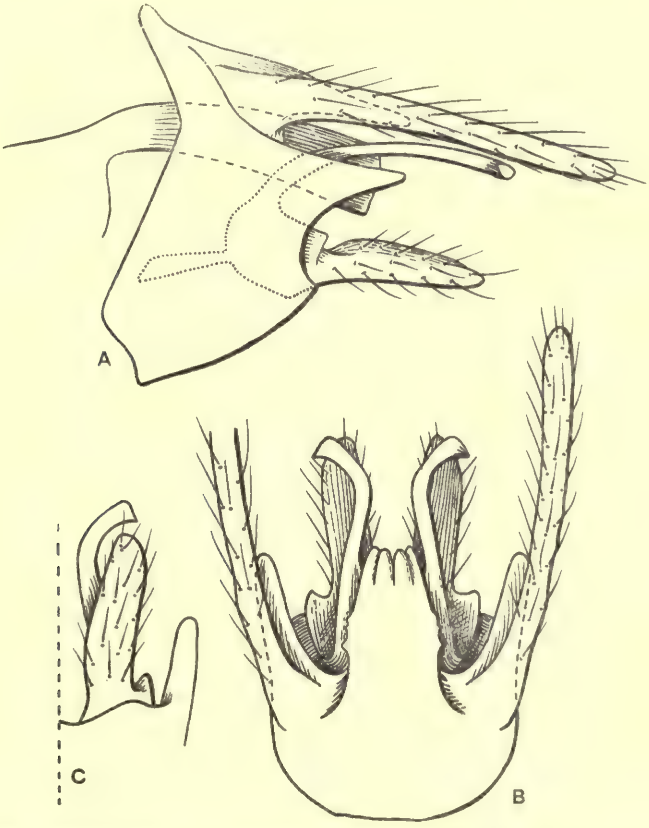

FIG. 2. *Stenopsyche griseipennis* McLachlan, ♂ genitalia of type. (A), lateral; (B), dorsal; (C), right clasper, ventral.

The association of the female *griseipennis* must be regarded as provisional, since

I have not had both sexes from the same locality even. The association is based upon a slightly broader and more truncate apex of the fore wing than in *S. pallidipennis* Martynov, the male of which is closely allied to *griseipennis*. The female thus provisionally assigned to *griseipennis* differs considerably from *pallidipennis* in the shape of the internal part of the subgenital plate.

♀ GENITALIA (example from Phedong, Sikkim). Eighth sternite from the side obliquely truncate apically, about one and a half times as long as deep, its lower apical angle rounded. From beneath the apical margin is divided into two rounded lobes, beyond which extends the subgenital plate, covering the membranous ninth sternite. The sides of the subgenital plate are more sclerotized than the centre and terminate in tufts of setae. Internal structure as indicated in Text-fig 3D. Ninth tergite saddle-shaped, with two groups of setae on each side. Tenth tergite and sternite each divided into two elongate sclerites. Cerci two-segmented, basal segment quadrate, terminal minute.

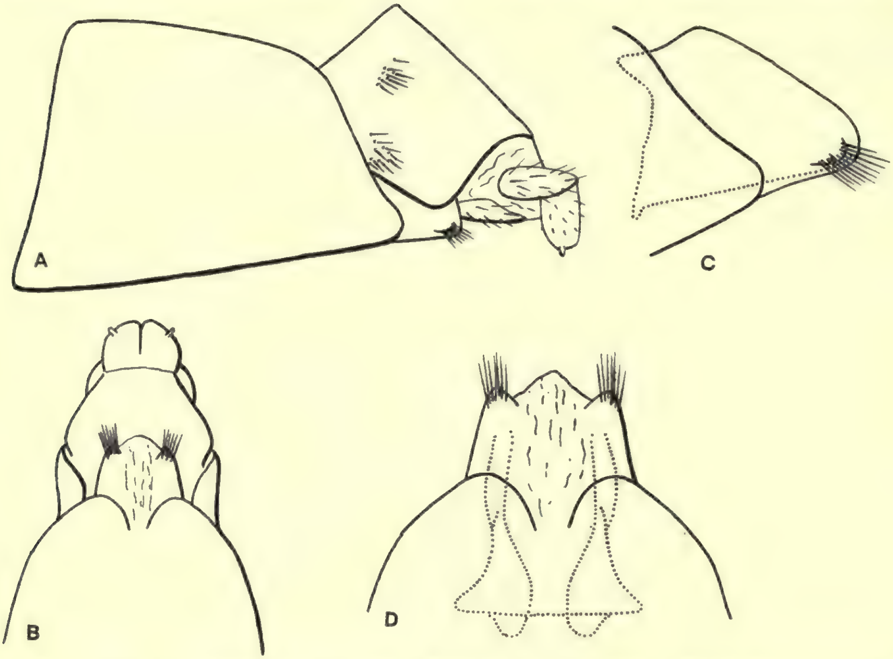

FIG. 3. *Stenopsyche griseipennis* McLachlan, ♀ genitalia. (A), eighth to tenth segments, lateral; (B), the same, ventral; (C), subgenital plate, lateral (more enlarged); (D), the same, ventral.

***Stenopsyche pallidipennis* Martynov**

(Text-figs. 4–6)

Stenopsyche pallidipennis Martynov, 1926, *Eos*, **2**: 297, figs. 22–24.

N.E.BURMA: Waingmew, 15.iii.1934, R. Malaise, 2 ♂, 5 ♀.

DISTRIBUTION. INDIA: United Provinces (Naini Tal); SIKKIM (Kalimpong); ASSAM (Khasi Hills); N. BURMA (Mishmi Hills).

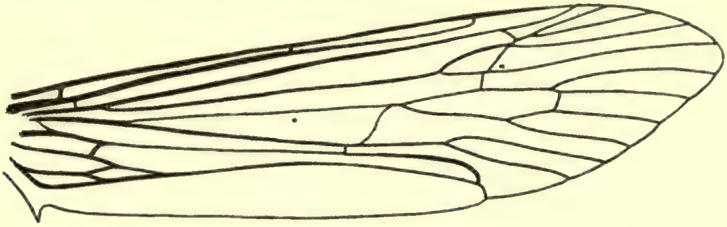

FIG. 4. *Stenopsyche pallidipennis* Martynov, ♂ fore wing.

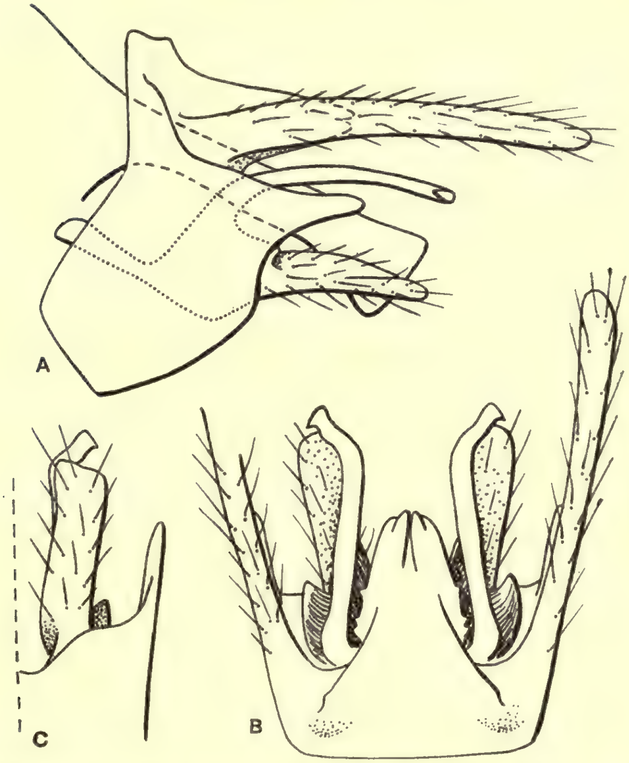

FIG. 5. *Stenopsyche pallidipennis* Martynov, ♂ genitalia. (A), lateral; (B), dorsal; (C), right clasper, ventral.

The male genitalia are very closely allied to those of *S. griseipennis*, the chief differences being the broader dorsal part of the ninth segment, produced in a hump near the base in side view, the less tapered tenth segment, whose apex is often obscurely four-lobed or even bilobed and the more truncate apices of the lower branches of the claspers. The pattern of the fore wing is much the same but the apex is rather more acute. In the female, assuming that sex to be correctly associated in *griseipennis*, the internal part of the subgenital plate is longer and narrower in side view, and the ventral view is quite different.

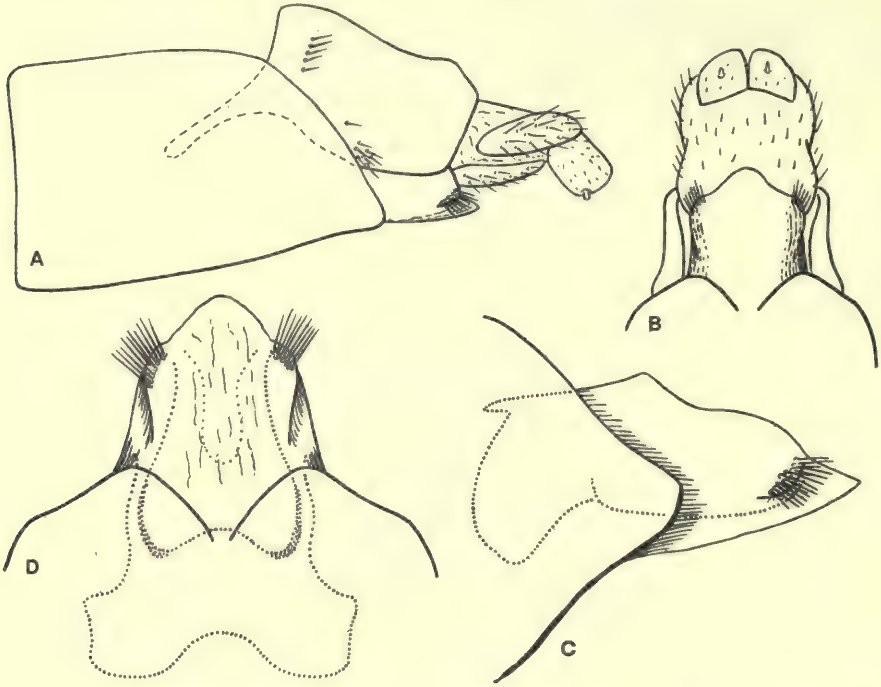

FIG. 6. *Stenopsyche pallidipennis* Martynov, ♀ genitalia. (A), eighth to tenth segments, lateral; (B), the same, ventral; (C), subgenital plate, lateral (more enlarged); (D), the same, ventral.

Stenopsyche khasia sp. n.

(Text-figs. 7–8)

ASSAM: Khasi Hills, ex McLachlan collection, 12 ♂, 5 ♀.

N. E. BURMA: Kambaiti, 6,800 ft., 10.iv.1934, R. Malaise, 4 ♂, 7 ♀.

General appearance much as in *S. griseipennis* or *S. pallidipennis*. Venation not significantly different from *griseipennis*.

♂ GENITALIA. Ninth tergite reduced dorsally to a narrow, transverse band. Side-pieces large, acute. Tenth segment forming a pair of tapering plates with acute apices, separated almost to their bases by a narrow excision. There is a small process on the upper surface of each near the base. Cercus long and slender. Aedeagus enclosing a pair of slender curved spines, two rows of broad, scale-like spines and two rows of small, slender spines. Clasper with the upper branch slender in side view, rather broader for most of its length in dorsal view, abruptly narrowed and

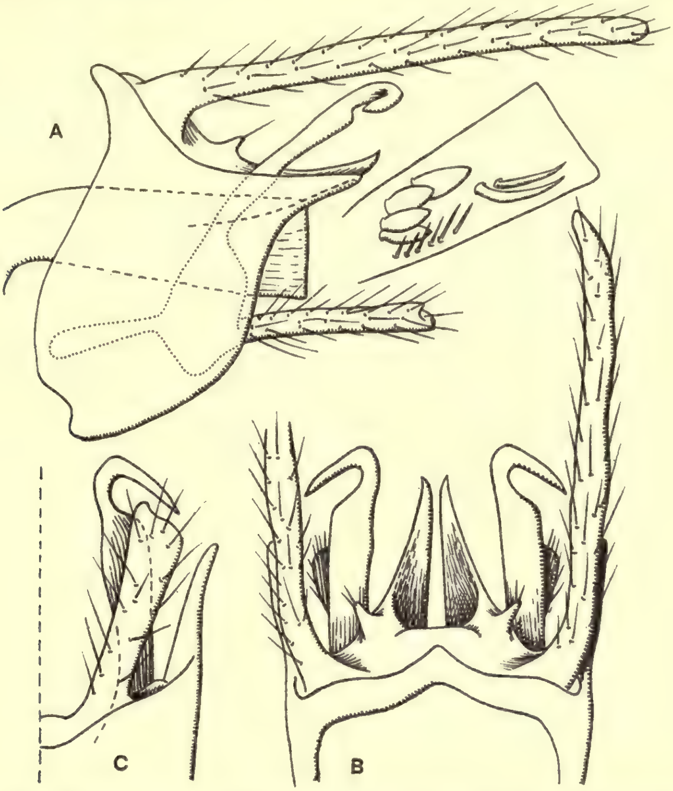

FIG. 7. *Stenopsyche khasia* sp. n. ♂ genitalia. (A), lateral (apex of aedeagus more enlarged); (B), the same, dorsal; (C), right clasper, ventral.

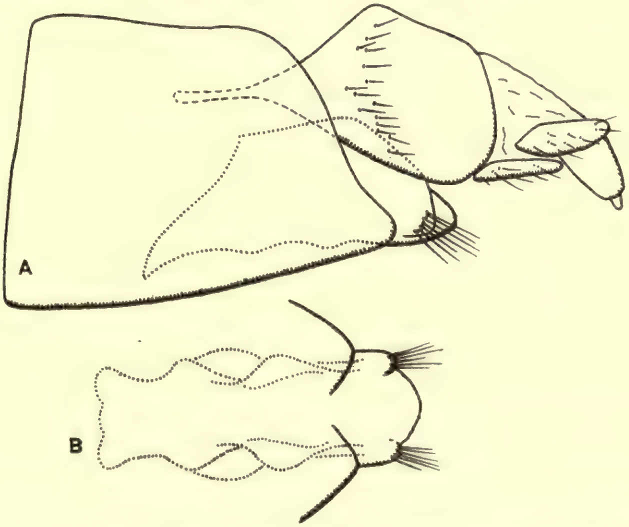

FIG. 8. *Stenopsyche khasia* sp. n. ♀ genitalia. (A), eighth to tenth segments, lateral; (B), subgenital plate, ventral.

hooked outwards at its apex. Lower branch slender, spatulate, apex obliquely truncate or slightly excised in ventral view.

♀ GENITALIA. Eighth sternite with its apical margin sinuously oblique in side view, lower apical angle slightly produced and rounded. Subgenital plate elongate, shaped as in Text-fig. 8. Ninth tergite with a band of setae.

Length of fore wing, ♂, 16–17 mm., ♀, 15–17 mm.

♂ holotype, ♀ allotype (with abdomen in glycerine), both from the Khasi Hills, in British Museum (Nat. Hist.), paratypes in the Stockholm and British Museum (Nat. Hist.). The differences between this species and *griseipennis* are given in the above comparative description.

Stenopsyche benaventi Navás

N. E. BURMA: Washaung, 20 km. east of Myitkyina, 14.vii.1934, R. Malaise, 2 ♂, 4 ♀.

Previous distribution. INDIA: Rewah State, Chota Nagpur.

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—— 1926. *Arch. Natg.* **91*A*** (5): 19–110.

BRITISH MUSEUM
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NATURAL HISTORY

A STUDY OF THE CHIRONOMIDAE (DIPTERA) OF AFRICA SOUTH OF THE SAHARA

PART IV

PAUL FREEMAN

BULLETIN OF
THE BRITISH MUSEUM (NATURAL HISTORY)
ENTOMOLOGY Vol. 6 No. 11
LONDON: 1958

A STUDY OF THE CHIRONOMIDAE (DIPTERA) OF AFRICA SOUTH OF THE SAHARA

PART IV

BY

PAUL FREEMAN xref.

Pp. 261–363 ; 2 *Plates* ; 15 *Text-figures*

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THE BULLETIN OF THE BRITISH MUSEUM (NATURAL HISTORY), *instituted in* 1949, *is issued in five series corresponding to the Departments of the Museum, and an Historical Series.*

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- 2 SEP 1958
NATURAL HISTORY

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A STUDY OF THE CHIRONOMIDAE (DIPTERA) OF AFRICA SOUTH OF THE SAHARA

PART IV

By PAUL FREEMAN

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SYNOPSIS

This is the final Part of the Study of which Parts I and II were published as Nos. 1 and 7 of Vol. 4 and Part III as No. 9 of Vol. 5 of the *Bulletin of the British Museum* (*Natural History*) (1955–57). In Part IV the other half of the large tribe Chironomini of the subfamily Chironominae is treated together with the tribe Tanytarsini. This half of the Chironomini includes the genera that normally have only one spur on the posterior tibia, that is, *Polypedilum* and its allies. Part IV is of interest because it includes no less than 15 of the 25 genera erected by

Kieffer in 1921 for African species of the Chironomini; these genera have remained virtually unknown since their description, but of the 15 it has been possible to redescribe or synonymize 13, only two remaining quite unknown.

In accordance with the principles used in previous Parts, the large genera used by Edwards in 1929 have been broken up into smaller units, so that the classification approaches that of Goetghebuer. Eight genera are recognized in this half of the Chironomini, two more are mentioned because they have been described by Kieffer but have not been recognized, more than 60 species are described, nine being new.

In the tribe Tanytarsini four genera are used, *Tanytarsus* being employed with four subgenera; nearly 30 species are treated, eight being new. It is probable that further collecting of these tiny insects will add considerably to the number of species.

Additional notes are also given of the distribution of the species of the family in Africa.

INTRODUCTION

PARTS I, II and III of this Study were published as Nos. 1 and 7 of Vol. 4 and No. 9 of Vol. 5 respectively of the *Bulletin of the British Museum* (*Natural History*) (1955-57). A general introduction to the family with special reference to the fauna of Africa south of the Sahara (Ethiopian Zoogeographical Region) was given in Part I which also dealt with subfamilies Tanypodinae, Diamesinae and Clunioninae. In Part II the species of the subfamilies Orthocladiinae and Corynoneurinae were described, whilst Part III treated the species of the first half of the tribe Chironomini of the subfamily Chironominae, that is with the large genus *Chironomus* and its allies. Part IV which is the last of the series, deals with the other half of the tribe Chironomini, that is with the genera centred around *Polypedilum* carrying only a single spur on the posterior tibia and also with the tribe Tanytarsini.

Since publication of Part III, further large collections have been sent to me by Monsieur J. Hamon and by Messrs. A. D. Harrison and B. R. Allanson to whom I indebted for this assistance. These and other collections received previously have enabled me to add further notes on the distribution of the species.

FURTHER NOTES ON DISTRIBUTION

In Part I of these Studies, I made some tentative remarks on the geographical distribution of the species in Africa south of the Sahara. Since I wrote that Part a good deal more material has become available and has caused me to revise some of my opinions.

It appears that the bulk of the species have a very wide distribution and that, so far as I can see, there is no fauna associated especially with the Guinean Forest. Several of Kieffer's peculiar species from Kribi have been found elsewhere, outside the forest or else I have been able to recognize them as species already known to me from other areas. Good examples are afforded first by *Kribiothauma pulchellum*, a distinctive and easily recognized species of which I now have a male from as far away from Kribi as Great Usutu River, Transvaal and secondly *Kribiocryptus viridiventris* which I now know to be *Chironomus* (*Cryptochironomus*) *niligenus*, a species recorded from both East and West Africa.

It is probable that the distribution of the species is much more dependent on water conditions, temperature, pH and availability of food than on other factors.

Presumably such light insects would be readily blown considerable distances by winds ; also river- and stream-dwelling larvae would be carried down-stream by the current, especially in flood conditions.

Additional material available to me since writing Part I numbers several thousand mounted and many tubes of spirit specimens, mainly from Cape Province, Transvaal, Belgian Congo, S. Rhodesia, Uganda, Nigeria and French West Africa. An interesting feature of it is the small number of species that are new to me and this also suggests that many of the species may have a wide distribution.

SUBFAMILY CHIRONOMINAE, TRIBE CHIRONOMINI (Continued)

The first section of this Tribe was considered in Part III of this Study ; the genera included there were those containing species normally with two spurs at the apex of the posterior tibia, that is, the genera centred around *Chironomus*. The present Part deals with the remainder of the Tribe, that is, with the genera with only one spur on the posterior tibia, centred around *Polypedilum*.

Kieffer recognized 18 genera of this section with African species. Of these, 15 were described as new in keys published in 1921. He published an earlier generic key without species (1921, *Ann. Soc. sci. Brux.* **40** (1) : 269–277) and a later one in the same year (1921, *Ann. Soc. ent. France*, **90** : 25–37) as part of his series of three papers on " Chironomides de l'Afrique equatoriale ". These two keys are similar but not identical ; species for most of the new genera were described either in the second paper or in the succeeding two papers of the series. Virtually none of these 15 genera has since been recognized, although Goetghebuer and Edwards incorrectly placed a species of *Nilothauma* in *Kribioxenus* (see Part III) and Goetghebuer, again incorrectly, described an African species of *Lauterborniella* in *Kribiomimus*.

It is clearly important from the point of view of the study of the Chironomidae as a whole to rediscover these genera and to redefine or synonymize them where necessary. I have been able to recognize 13 of them and in Table I, I am listing all 15 with their position or probable position in this Study. I am giving such diagnoses as are possible for the two unidentified genera *Kribioxenus* and *Kribiomyia*.

KEY TO AFRICAN GENERA OF TRIBE CHIRONOMINI

SECTION II : genera regularly with only one spur on posterior tibia.

1. Squama bare ; femora often swollen apically to form a slight club 2
   Squama fringed ; femora only swollen apically in *Lepidopodus* 3
2. Pulvilli well developed ; antenna of female with 6–7 segments ; VIIIth abdominal segment of male not contracted basally . . . . . . *Lauterborniella* Bause
   Pulvilli scarcely distinguishable ; female antenna with 5 segments ; VIIIth segment of male contracted basally . . . . *Kribiodosis* Kieffer
3. Wing membrane with macrotrichia at least at the apex *Polypedilum* subg. *Pentapedilum* Kieffer
   Wing membrane quite bare of macrotrichia 4
4. Anterior tibial scale armed with a spur 5
   Anterior tibial scale quite unarmed 8

5. Anterior tibial spur strong and usually curved ; pulvilli either absent or inconspicuous ; VIIIth abdominal segment of male not constricted basally . . 6
   Scale either triangular and with a sharp point or oval and with a short spur at the apex, rarely with a longer spur ; pulvilli conspicuous, each split longitudinally (only visible in slide mounts) ; VIIIth segment of male constricted basally *Polypedilum* Kieffer
6. Wings plain . . . . *Kribioxenus* Kieffer
   Wings with dark pattern 7
7. Wings broad, posterior fork short (Pl. 2, fig. *r*) ; male antenna with all segments approximately equal, plumes absent (Text-fig. 9, *c*) . . . *Kribiothauma* Kieffer
   Wings of normal shape, fork below cross-vein (Pl. 2, fig. *m*) ; male antenna normal, A.R. about 0·6 . . . . *Kribiocosmus* Kieffer
8. Prothorax reduced centrally but produced laterally as a short tubercle ; legs long and slender, clothed with adpressed scales as well as erect bristles . *Lepidopodus* gen. nov.
   Prothorax not like this ; legs without scales 9
9. Prothorax much reduced, head overhung by mesonotum ; acrostichal bristles reduced to a group at the apex of the mesonotal cone, no central mesonotal tubercle . . . . *Microtendipes* Kieffer
   Prothorax less reduced ; acrostichal bristles either as a complete double row or quite absent ; mesonotum often with a central tubercle *Stictochironomus* Kieffer and ? *Kribiomyia* Kieffer

TABLE I.—*Single-spurred Genera Described by Kieffer in* 1921 *from African Species*

Genus	Position in present Study
Kribiothauma	Valid genus of uncertain affinities.
Kribiodosis	Valid genus allied to *Lauterborniella*.
Kribiodorum	Synonym of *Lauterborniella*.
Tripedilum	Synonym of *Polypedilum*.
Kribiocosmus	Valid genus.
Kribioxenus	Not identified.
Kribiomimus	Synonym of *Microtendipes*.
Kribiocharis	Synonym of *Polypedilum*.
Kribionympha	Synonym of *Polypedilum*.
Kribiocallis	Synonym of *Stictochironomus*.
Kribiomyia	Not identified.
Kribiotima *Kribiophilus*	Probably two names for the same genus (q.v.) ; synonym of *Polypedilum*.
Rosenia	Synonym of *Polypedilum* subg. *Pentapedilum*.
Kribiopelma	? Synonym of *Polypedilum* subg. *Pentapedilum*.

Genus ***POLYPEDILUM*** Kieffer

Polypedilum Kieffer, 1913, *Bull. Soc. Hist. nat. Metz*, **28** : 15.
Pentapedilum Kieffer, 1913, *ibid.* **28** : 25.
Chironomus subg. *Polypedilum* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 401.
Pentapedilum subg. *Pentapedilum* Edwards, 1929, *ibid.* **77** : 376.

Antennae of male with 14 segments, of female with 6 segments ; frontal tubercles only occasionally present. Pronotum moderately developed, usually not visible from above, mesonotum without a central hump or tubercle (see *Stictochironomus*) both acrostichal and dorso-central bristles well developed and long. Front tibial scale either triangular and sharply pointed or else oval and with a small but definite spur, rarely with a longer spur ; outer comb of posterior tibia and posterior comb of middle tibia each with a single spur which is usually quite long, the other comb of each leg is large and simple ; combs not fused ; pulvilli each split longitudinally into two narrow lobes, so that with the empodium there appear to be five processes below the tarsal claws (only visible in slide mounts). Wing membrane with or without macrotrichia and either unmarked or with well-formed dark clouds and spots ; squama with complete fringe ; R_{2+3} ending not far beyond tip of R_1, posterior fork slightly or considerably beyond r-m. Eighth abdominal segment of male constricted basally so as to appear triangular ; anal point well developed, appendage 2 usually with a long terminal hair, styles of variable shape.

In his 1929 paper on the British species of the family, Edwards treated *Polypedilum* as a subgenus of *Chironomus* and *Pentapedilum* as **a** separate genus to include all the hairy-winged groups outside the Tanytarsini. In 1931 (*Dipt. Pat. S. Chile*, **2** : 310) he revised his opinion about *Pentapedilum*, realizing that the included groups were not really closely allied and he restricted the name to the group treated as subg. *Pentapedilum* in his 1929 work.

Species of *Pentapedilum* in this restricted sense are extremely similar to species of *Polypedilum*, differing only in the presence of macrotrichia on the wing membrane. As pointed out by Edwards this is not always a good character by any means, and the African species bear out this view, one species having hair at the extreme wing apex only. I do not agree with Edwards that both *Polypedilum* and *Pentapedilum* should be considered as equal subgenera of *Chironomus* but I prefer to follow Townes (1945, *Amer. midl. Nat.* **34** : 36) and place both as subgenera of the genus *Polypedilum*. Townes's third subgenus *Tripodura* is discussed under the subgenus *Polypedilum*.

Polypedilum is one of the better defined genera of the family. In doubtful cases examination of the pulvilli and eighth segment of the male abdomen affords ready means of determining the genus. As I have previously pointed out, Edwards (1929) denied the presence of split pulvilli, but these can be seen in slide mounts under high magnification and have been figured by Townes (1945). It is a very abundant genus in Africa south of the Sahara.

KEY TO SUBGENERA OF *Polypedilum*

Macrotrichia present on wing membrane at least at apex of cell R_{4+5} ; wings without dark markings . . . . *Pentapedilum* Kieffer
Macrotrichia entirely absent from wing membrane ; wings frequently with conspicuous dark markings . . . . *Polypedilum* Kieffer

Polypedilum KIEFFER SUBGENUS ***Polypedilum*** SENSU STRICTO

Polypedilum Kieffer, 1913, *Bull. Soc. Hist. nat. Metz*, **28** : 15 ; Kieffer, 1913, *Voy. All. Jean. Afr. Or. Ins. Dipt.* **1** : 21 ; Kieffer, 1918, *Ann. Mus. nat. Hung.* **16** : 65 ; Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 97 (in part) ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 19 ; Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, **1924** : 265 ; Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 480 ; Goetghebuer, 1937, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*) : 56 ; Townes, 1945, *Amer. midl. Nat* **34** : 36 ; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. G. F. de Witte, fasc. **83** : 25.

Chironomus Kieffer, 1911, *Trans. Linn. Soc. Lond.* (*Zool.*) **14** : 351 (in part) ; Kieffer, 1918, *Ann. Mus. nat. Hung.* **16** : 66 (in part).

Paratendipes Kieffer, 1913, *Voy. All. Jean. Afr. Or. Ins. Dipt.* **1** : 24 (not Kieffer, 1911, *Bull. Soc. Hist. nat. Metz,* **28** : 41).

Tripedilum Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 271 ; Kieffer, 1921, *Ann. Soc. ent. France,* **90** : 28 and 47 (SYN. NOV.).

Kribiomimus Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 271 ; Kieffer, 1921, *Ann. Soc. ent. France,* **90** : 29 and 49 (in part).

Kribionympha Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 271 ; Kieffer, 1921, *Ann. Soc. ent France,* **90** : 29 ; Kieffer, 1922, *ibid.* **91** : 7 (SYN. NOV.).

Kribiotima Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 274 (SYN. NOV.).

Pentapelma Kieffer, 1921, *ibid.* **41** (1) : 98 (? not Kieffer, 1921, *ibid.* **40** (1) : 274 and 1921, *Ann. Soc. ent. France,* **90** : 33).

Kribiophilus Kieffer, 1921, *ibid.* **90** : 30 and 1922, *ibid.* **91** : 43 ; Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 98 (SYN. NOV.).

Kribiocharis Kieffer, 1922, *Ann. Soc. ent. France,* **91** : 1 (in part).

Microtendipes Kieffer, 1922, *ibid.* **91** : 8 (not Kieffer, 1915, *Broteria, Sér. Zool.* **13** : 70).

Chironomus subg. *Polypedilum* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 401.

Polypedilum subg. *Tripodura* Townes, 1945, *Amer. midl. Nat.* **34** : 36.

This, the typical subgenus, differs from *Pentapedilum* solely by the absence of macrotrichia on the wing membrane.

Kieffer appears to have depended almost entirely on the condition of the pulvilli for generic determination of species of *Polypedilum* and, because this is a most difficult character to see without special preparation, he seems often to have made mistakes. For instance, after examination of type specimens, I have found that he placed *Polypedilum alticola* in *Polypedilum* in 1913, but that he redescribed it in 1918, this time in *Chironomus*. Having realized this, it became possible to identify not only several of his species of *Polypedilum* which he had placed in the wrong genera, but also to place in synonymy the genera *Tripedilum* (type *armatifrons* monobasic) and *Kribionympha* (type *declivis* monobasic). *Tripedilum armatifrons* was described from two females with frontal tubercles and is the same species as he later described as *Polypedilum longiforceps* from the male ; both fall as synonyms of *P. fuscipenne*. It is interesting to see that although he mentioned the prominent frontal tubercles in the former, he omitted them in the latter, but the figure of the male hypopygium renders *longiforceps* easily identifiable. *Kribionympha declivis* is a very similar species, the pulvilli are split and the eighth segment of the male abdomen is narrow basally.

I was in error in 1955 in placing *Kribiocharis* as a synonym of *Microtendipes* ; Kieffer's mention of the triangular eighth segment of the male abdomen makes it clear that the type species (*K. filitarsis* fixed by me in 1955) is a species of *Polypedilum* similar to and probably identical with *P. tenuitarsis*.

Kieffer was rather confused in his use of the two genera *Kribiotima* and *Kribiophilus*. The former was described (*Ann. Soc. sci. Brux.* **40** (1) : 274) in a key, no included species were given and so far as I can discover, the genus was not mentioned by him in print again. In his 1921–23 series of papers (*Ann. Soc. ent. France,* **90–92**) the place of *Kribiotima* in the key is taken by *Kribiophilus*, for which there are two described species neither being fixed as the type of the genus. There is in the British Museum a postcard written by Kieffer to W. L. Sclater on 5th September, 1923 on which he says that *Kribiophilus* (type *pictipennis*) is a subgenus of *Kribiotima*. Again in 1921 (*Ann. Soc. sci. Brux.* **41** (1) : 98), he refers to *Kribiophilus* but this time as a subgenus of *Polypedilum.*

It seems probable that *Kribiotima* was an earlier name and *Kribiophilus* a later name for the same genus and that the latter is to be regarded as a synonym and not a subgenus of the former. I hereby fix *K. pictipennis* Kieffer, 1922 as type of the genus *Kribiophilus.* Because this is a redescription of *Polypedilum quinqueguttatum* Kieffer, *Kribiophilus* automatically falls as a synonym of *Polypedilum.* There is no discernible difference between *Kribiophilus* and *Kribiotima,* both being separated from *Polypedilum* according to Kieffer by the greater width between the eyes, and so *Kribiotima* also falls as a synonym of *Polypedilum.*

Pentapelma was originally described by Kieffer in June 1921 (*Ann. Soc. sci. Brux.* **40** (1) : 274) as a genus with hairy wings belonging to " Groupe *Tanytarsus* ". No type was fixed but in a paper published on 14th December, 1921 (*Ann. Soc. ent. France,* **90** : 33) he fixed *zavreli* Kieffer. However, two days before this, on 12th December, 1921 another paper of his was published (*Ann. Soc. sci. Brux.* **41** (1) : 98) in which *Pentapelma* was used as a plain-winged subgenus of *Polypedilum* with *integrum* Kieffer as type of the subgenus. Later authors have followed this interpretation, but whichever is followed both appear to be synonyms, the division of *Polypedilum* on wing colour not being valid.

Kieffer (1922, *Ann. soc. ent. France,* **91** : 8) used *Microtendipes* for ten species with pointed or spurred scale to the anterior tibia, a character unknown in the species of that genus as it is understood now. Those of the ten that I have been able to identify are species of *Polypedilum* and it is likely that the remainder belong here as well, but as only three were described from males it is difficult to be certain. I am treating them as species of *Polypedilum* until there is evidence that they belong to other genera.

Townes (1945, *Amer. midl. Nat.* **34** : 36) erected the subgenus *Tripodura* for the group of species with lateral teeth to the anal point (" trifid ") and with appendage 1 broad. There seems to be too much variation and intergrading for this subdivision to be accorded subgeneric rank and I am accordingly regarding it as a synonym.

The genus cannot easily be subdivided into subgenera although quite well marked species groups can be seen. The division into those with plain wings and those with patterned wings is not valid because of the existence of species, such as *tridens,* with plain wings having their most obvious allies amongst species with strongly patterned wings.

Many of the species of *Polypedilum* are common and widespread, they are also subject to a good deal of variation. That this variation is infraspecific is fairly certain from study of species with distinctive features such as *griseoguttatum* or *ramiferum.* In each of these two species the male hypopygium is of an unusual form and the wing markings are also rather different from those of most other species. In *griseoguttatum* there is variation from locality to locality in the shape of the markings in cell R_5 and in the development of the lateral teeth at the base of the anal point as well as in the number of hairs on appendage 2. In *ramiferum* the male hypopygium shows some differences in the shape of the parts, but the main variation lies in leg colour and intensity of wing markings. A number of the species of Kieffer and Goetghebuer have been described from varieties of this type and by realizing the plastic nature of the wing markings of many species I have been able not only to arrive at a better understanding of the limits of a given species but also to synonymize many of the older names.

Seventy species have been described in *Polypedilum* from Africa south of the Sahara and from Egypt, but three from Egypt seem to be Palaearctic in distribution and have been omitted ; in addition Kieffer has described in other genera a number of species really belonging to *Polypedilum.* In particular, as mentioned above, he seems to have been confused between *Polypedilum* and *Microtendipes* in his 1921–23 papers. Of the 67 described in *Polypedilum,* 13 do not belong there and others are redescriptions of previously described species.

In the material at my disposal, I am able to recognize 36 species of which four are new. Into the 32 species that are not new, a very high proportion of the previously described species can be fitted either as valid species or as synonyms, but there still remain one species of *Paratendipes,* five of *Polypedilum* and five of *Microtendipes* described by Kieffer mostly from females which I am unable satisfactorily to place. These are as follows :

Polypedilum lumiense and *Paratendipes tavetanus* 1913, *Voy. All. Jean. Afr. Or. Ins. Dipt.* **1** : 21–22. The type series of these are in the Paris Museum, but being small plain winged females it is not possible to assign them to one of the species described below. Type locality of both KENYA : Taveta.

Polypedilum leucolabis 1922, *Ann. Soc. ent. France,* **91** : 22. Described from a male with plain wings ; the hypopygium is white, appendage 1 narrow and curved, appendage 2 bilobed at the extremity. Type locality FRENCH CAMEROONS ; Kribi.

Polypedilum nymphella 1922, *ibid.* **91** : 26. Described from a small female which was separated from other species mainly by being entirely whitish and is probably unrecognizable. Type lost, locality Kribi.

Polypedilum distans 1922, *ibid.* **91** : 27. Again described from a pale female (length 2·5 mm.) with plain wings, but as the scale of the anterior tibia is rounded it may not belong to this genus at all. Type lost, locality SUDAN : Shambe.

Polypedilum pumilio 1922, *ibid.* **91** : 28. The small male from which this was described (length 1·5 mm.) was separated from *distans* by the mouthparts equalling only half the height of the head ; hypopygium simple, appendage 1 curved and narrow Type lost, locality Kribi.

Microtendipes magnipennis, pilosicornis, truncatus kribiensis and *calcaratus* 1922, *ibid.* **91** : 12–14. All were described from females from Kribi and were separated from each other by minor structural points ; they may well be females of species of the group of *Polypedilum fuscipenne* and *longinervis.* All the types are lost.

KEY TO AFRICAN SPECIES OF *Polypedilum* SUBGENUS *Polypedilum*

1. Wings patterned, usually boldly marked with dark spots and clouds, in a few species markings faint but distinguishable in cell R_5 or at cross-vein and posterior fork . 2
   Wings without markings in any of the cells 17

2. Wing markings very faint (Pl. 1, figs. *c*, *k*) ; occasional specimens of *quinqueguttatum* have very pale spots and can be recognized by the male hypopygium . . . 3
Wing markings bold 5
3. Three faint spots in cell R_5 ; anal point not trifid (Text-fig. 1, *b*) . *deletum* Goetghebuer
Faint clouds in base only of cell R_5 and over Cu 4
4. Anal point trifid (Text-fig. 2, *e*) . . . . *aegyptium* Kieffer
Anal point simple (Text-fig. 2, *f*) . . . . *subovatum* sp. n.
5. Wings with a discrete dark spot in basal cell, basal to cross-vein (e.g. Pl. 1, figs. *f*, *l*) 6
Wings lacking a dark spot here although there may be general clouding . . 8
6. Cell R_5 with three spots of variable shape (Pl. 1, figs. *l*–*o*) . . *griseoguttatum* Kieffer
Cell R_5 with two spots only 7
7. Base of cell R_5 clear (Pl. 1, fig. *f*) . . . . *abyssiniae* Kieffer
Base of cell R_5 with a dark spot (Pl. 1, fig. *h*) . . . . . . *longicrus* Kieffer
8. Wing very dark or blackish with clear spots (Pl. 1, fig. *r*) . . *alboguttatum* Kieffer
Wing much paler, pattern different 9
9. Base of cell R_5 with a large clear area (Pl. 1, figs. *d*–*e*) 10
Base of cell R_5 occupied by a dark spot 11
10. Wing markings as in Pl. 1, fig. *d*, cross-vein clouded . . . . . *tenuitarsis* Kieffer
Wings with cross-vein clear (Pl. 1, fig. *e*) 10*a*
10*a*. Anal point of male simple (Text-fig. 1, *e*) ; tract in cell M_2 entire (Pl. 1, fig. *e*) *annulatipes* Kieffer
Anal point trifid ; tract broken into two spots . . . . . . *allansoni* sp. n.
11. Basal third of cell R_5 occupied by a large dark conspicuous mark (Pl. 1, fig. *a*) ; a large dark species . . . . *alticola* Kieffer
The spot in this position much smaller 12
12. Abdominal segments with pale apical rings, wings as in Pl. 1, figs. *p*, *q* 13
Abdominal segments without pale rings 14
13. Legs with yellow and black markings on tibiae and tarsi ; wings as in Pl. 1, fig. *p* ; male styles with long plumose hairs (Text-fig. 3, *a*) . . . . . *ramiferum* Kieffer
Legs without these markings ; wings as in Pl. 1, fig. *q* ; style hairs simple, appendage 1 reduced (Text-fig. 3, *b*) . . . . *albosignatum* Kieffer
14 Wing length 2·5 mm. or more, large dark species, wing pattern as in Pl. 1, fig. *b*) ; male hypopygium similar to *alticola* (Text-fig. 1, *a*) . . . . . *natalense* Kieffer
Wing length 1·5 mm. or less, very small species 15
15. Cell R_5 with three dark markings (Pl. 1, fig. *j*) ; male hypopygium as in Text-fig. 2, *d* *pruina* Freeman
Cell R_5 with only two dark spots 16
16. Wings with dark spots below apices of veins M_{1+2} and M_{3+4} (Pl. 1, fig. *g*) ; anal point of male very fine (Text-fig. 2, *a*), not trilobed . . . . *quinqueguttatum* Kieffer
Wing markings without these spots (Pl. 1, fig. *i*) ; anal point broad and with lateral spines making it appear trifid (Text-fig. 2, *c*) . . . . . *tropicum* Kieffer
17. Well-developed frontal tubercles present 18
Frontal tubercles absent 20
18. L.R. more than 2 ; thorax mainly pale or reddish ; male front tarsi not bearded . 19
L.R. about 1·1 ; thorax black ; male front tarsi bearded . . *lobiferum* Freeman
19. Scale of front tibia short and black, spur long and black ; male styles long (Text-fig. 3, *d*). . . . . *fuscipenne* Kieffer
Scale of front tibia longer and yellow, spur very short and dark ; male styles more or less oval (Text-fig. 3, *e*) . . . . *declivis* Kieffer
20. Eyes practically touching above ; anterior tibiae black . . *subconfluens* Kieffer
Eyes separated by at least the apical width of the narrow portion 21
21. Thorax pale but with a strongly marked dark lateral stripe on the pleuron . . 22
If thorax pale then pleuron without obvious dark stripe 23

22. Larger species, wing length 2–3 mm., cross-vein long ; appendage 1 of male hypopygium bilobed (Text-fig. 3, *g*) . . . *longinervis* Kieffer

Very small species, wing length 1·6–8 mm., cross-vein normal ; appendage 1 not bilobed . . . *laterale* Goetghebuer

23. Segments 1–5 of abdomen yellow with a saddle-shaped black spot on segment 3, thorax and segments 6–8 black . . . *ephippium* sp. n.

Abdomen not like this, if it is pale then there is no black spot on segment 3 only . 24

24. Thorax and abdomen black . . . 25

Thorax and abdomen at the most brown, usually paler . . . 27

25. Small species, wing length 1·5 mm., anal point trifid (Text-fig. 2, *g*) . *tridens* Freeman

Larger, wing length 2–3 mm., anal point simple . . . 26

26. Halteres black . . . *fuscum* Freeman

Halteres pale . . . *incoloripenne* Goetghebuer

27. Thorax yellowish and with a pair of circular black spots at enterior ends of lateral stripes . . . *bipustulatum* sp. n.

Thorax without these spots . . . 28

28. Appendage 1 of male hypopygium broad (Text-fig. 4, *d*) . . . 29

Appendage 1 narrow (Text-figs. 4, *a*, *e*, *g*) . . . 30

29. Abdomen pale, sometimes with narrow dark rings at apices of segments *kibatiense* Goetghebuer

Abdomen dark with pale rings at apices of segments . . . *annulatum* Freeman

30. Halteres black . . . 31

Halteres pale . . . 32

31. A.R. of male 1·6, styles wider (Text-fig. 4, *e*) . . . *brunneicornis* Kieffer

A.R. only 0·5, styles narrower (Text-fig. 4, *g*) *melanophilus* Kieffer and *glabripennis* Kieffer

32. Front tibial scale with short spur ; colour pale brown . . . 33

Front tibial spur black and as long as the scale ; colour darker brown *vanderplanki* Hinton

33. Appendage 1 of male hypopygium strongly curved and with a narrow apex (Text-fig. 4, *a*) . . . *bifalcatum* Kieffer

Appendage 1 similar to *brunneicornis* (Text-fig. 4, *e*) . . . *dewulfi* Goetghebuer

Polypedilum (Polypedilum) alticola Kieffer

Polypedilum alticola Kieffer, 1913, *Voy. All. Jean. Afr. Or. Ins. Dipt.* **1** : 22 ; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte **83** : 26 ; Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2** : 377.

Chironomus ornatipennis Kieffer, 1918, *Ann. Mus. nat. Hung.* **16** : 68 (SYN. NOV.).

A large dark species with strongly marked wings. It is readily recognized by the large dark spot which fills the basal quarter or third of cell R_5 ; male styles very bulky, hypopygium similar to *natalense*. It is a species found especially in mountainous regions but in South Africa there are specimens more or less intermediate between it and *natalense* suggesting that the two may only be forms of each other.

Male. Wing length 3–4·5 mm.

Head and mouthparts blackish, antennae brown, A.R. about 1·5, frontal tubercles absent. *Thorax* blackish or dark brown, dorso-central and acrostichal bristles strongly developed and pale, lines of hairs and thoracic margins pruinose. *Legs* yellowish or brownish, femora may be darker, anterior tibia subequal to femur, L.R. about 1·4, scale triangular and with tiny spur, tarsus not bearded. *Wings* (see Pl. 1, fig. *a* of female) strongly marked and clouded, although not as strongly as in the female; the most conspicuous spots are in cell R_5, the basal one occupying sometimes a third of the cell and usually at least a quarter, other markings more vague; some specimens from Cape Province and Natal, have the basal mark in cell R_5 smaller than usual and the other markings more discrete, thus approaching the condition seen in *natalense*; halteres with black knobs and pale stems. *Abdomen* black, apices of segments or sometimes whole incisures pale; hypopygium (Text-fig. 1, *a*) with bulky styles, appendage 1 and anal point both narrow, exactly similar to *natalense*.

Female resembles male; wing markings more intense, abdomen may have more extensive pale markings, especially laterally.

I have seen cotypes of *alticola* in Muséum National d'Histoire Naturelle, Paris (type locality KENYA: nr. Fort Hall) and also the type male of *ornatipennis* which was in the Hungarian National Museum (NATAL: New Hanover).

DISTRIBUTION. CAPE PROVINCE: 2 ♂, Berg R., Assegaibos, ii.1953 (*K. M. F. Scott*). NATAL: 1 ♂, Kloof, ix.1926 (*R. E. Turner*); 1 ♂, 5 ♀, Natal National Park, iii.1932 (*A. Mackie*); 6 ♂, 2 ♀, Estcourt, ix.1953 (*A. D. Harrison*). TRANSVAAL: 5 ♂, nr. Lydenburg, v.1951 (*P. Brinck*). S. RHODESIA: 1 ♂, Umtali, iv.1929 (*A. Cuthbertson*). ANGOLA: 1 ♀, Benguela (*L. Massey*). TANGANYIKA: 1 ♀, Njombe, 6,000 ft., ii.1951 (*W. Peters*). BELGIAN CONGO: 102 ♀, Parc. Nat. Albert (de Witte); 1 ♀, V. Karissimbi, Nya Muzinga, i.1926 (*H. Schouteden*). KENYA: 4 ♂, Kabete (*R. H. Deakin*) and 5 ♀, xi.1913 (*T. J. Anderson*); 2 ♂, Nairobi, v.1927 (*Symes & Hopkins*); 1 ♀, Solai Distr., Sonje V., ix.1919 (*T. J. Anderson*); 11 ♂, Mt. Elgon, Heath Zone, 10,500–11,500 ft., ii.1935 (*F. W. Edwards*); 1 ♀, Mt. Kinangop, Aberdare Range, 8,000 ft., x.1934 (*F. W. Edwards*). ETHIOPIA: 2 ♂, Bahrdar, x–xi.1952 (*G. Covell*); 2 ♀, Dessie, xii.35–i.36 (*J. W. S. Macfie*); 1 ♀, Waldia, i.1936 (*J. W. S. Macfie*); 1 ♂, 1 ♀, Alamata, iii.1936 (*J. W. S. Macfie*); 1 ♂, Koram, iii.1936 (*J. W. S. Macfie*). SUDAN: 5 ♂, 48 ♀, W. Darfur, Jebel Murra, Killing, 7,000 ft., vi.1932 (*M. Steele*).

Polypedilum (Polypedilum) natalense Kieffer

Chironomus natalensis Kieffer, 1918, *Ann. Mus. nat. Hung.* **16**: 67.
Polypedilum brevistilum Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23**: 178 (SYN. NOV.).

Similar to *alticola* in general appearance and structure, wing length 2·5–2·75 mm., thorax more generally pruinose, abdomen without pale rings at the incisures, but sometimes paler laterally; hypopygium similar to *alticola*. The main difference between the two lies in the wing markings which are much more restricted and discrete in *natalense* (Pl. 1, fig. *b*). As stated under *alticola* there are specimens of that species with wing markings approaching those of *natalense* suggesting that the two may be forms of one species, but longer series and more distributional data are necessary before it is possible to decide this.

I have seen the holotype male of *natalense* which was in the Hungarian National Museum (type locality NATAL: New Hanover). The holotype male of *brevistilum* is in the British Museum (CAPE PROVINCE: Berg River).

DISTRIBUTION. Apart from the holotypes and other specimens from the type localities of CAPE PROVINCE, NATAL and BELGIAN CONGO: Elisabethville, I have seen: TRANSVAAL: 1 ♀, Pongola R. Settlements, ix.1954 (*A. D. Harrison*); 2 ♀, Lydenburg, ix.1954 (*A. D. Harrison*). S. RHODESIA: 1 ♀, Salisbury, v.1956 (*E. T. M. Reid*). NYASALAND: 1 ♂, Langenburg (*Füllerborn*).

Polypedilum (Polypedilum) deletum Goetghebuer

Polypedilum deletum Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 483; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2**: 377.

Polypedilum obsoletum Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 488; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, **83**: 27 (SYN. NOV.).

Blackish or very dark brown, legs pale, halteres black, wings with three faint grey spots in cell R_5 and with veins more or less seamed with grey; male styles swollen, anal point and appendage 1 simple. Although the wing markings are much paler than in *alticola*, their positions are similar and the male genital structure also bears a resemblance.

Male. Wing length 2–3 mm.

Head and mouthparts black or very dark brown, frontal tubercles absent, antennae brown, A.R. about 2. *Thorax* blackish or very dark brown, slightly pruinose, bristles dark, scutellum sometimes paler; pruinosity of hair lines and of stripes changeable. *Legs* yellow, femora sometimes darker, tarsal beard absent, L.R. 1·75, anterior tibial scale oval and with a short colourless spine. *Wings* (Pl. 1, fig. *c*) practically hyaline but with faint grey spots in the base, near the middle and at the apex of cell R_5; veins, especially fork veins, more or less grey seamed or clouded. Halteres with black knobs. *Abdomen* black or dark brown, without pale bands; hypopygium (Text-fig. 1, *b*) with styles swollen but less so than in *alticola*, anal point and appendage 1 narrow.

Female resembles male.

I have seen the holotypes of both species; *deletum* is clearly the male (BELGIAN CONGO: Vitshumbi) and *obsoletum* the female (UGANDA: Namasagali) of the same species; both are in Musée Royal du Congo Belge, Tervuren.

DISTRIBUTION. GOLD COAST: 2 ♀, Red Volta, Nangodi, x.1954 (*G. Crisp*). NIGERIA: 2 ♀, Kankiya (*B. McMillan*). UGANDA: 2 ♂, Jinja, i.1956 (*P. S. Corbet*). BELGIAN CONGO: series from Parc Nat. Albert and from Kivu; 2 ♂, 5 ♀, Elisabethville, xii.1938 (*H. J. Brédo*). S. RHODESIA: 8 ♂, Salisbury, v.1956 (*E. T. M. Reid*). TRANSVAAL: 2 ♀, Letaba, v.1951 (*P. Brinck*).

Polypedilum (Polypedilum) fuscum Freeman

Polypedilum fuscum Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23**: 177.

A medium-sized black species, very similar to *deletum*, from which it may be separated by the wing markings and possibly by the male genital structures. The wings have no distinct spots but the veins are seamed with grey and there is a grey longitudinal shadow just discernible in cell R_5 running the complete length of the cell just behind vein R_5; halteres black. Male hypopygium (Text-fig. 1, *c*) with styles more pointed than in *deletum* and with proportions of parts slightly different, but this may be variable. Whether this species and the following one are really distinct from *deletum* is not certain, but until more is known of the range of variability it is convenient to maintain them as separate species.

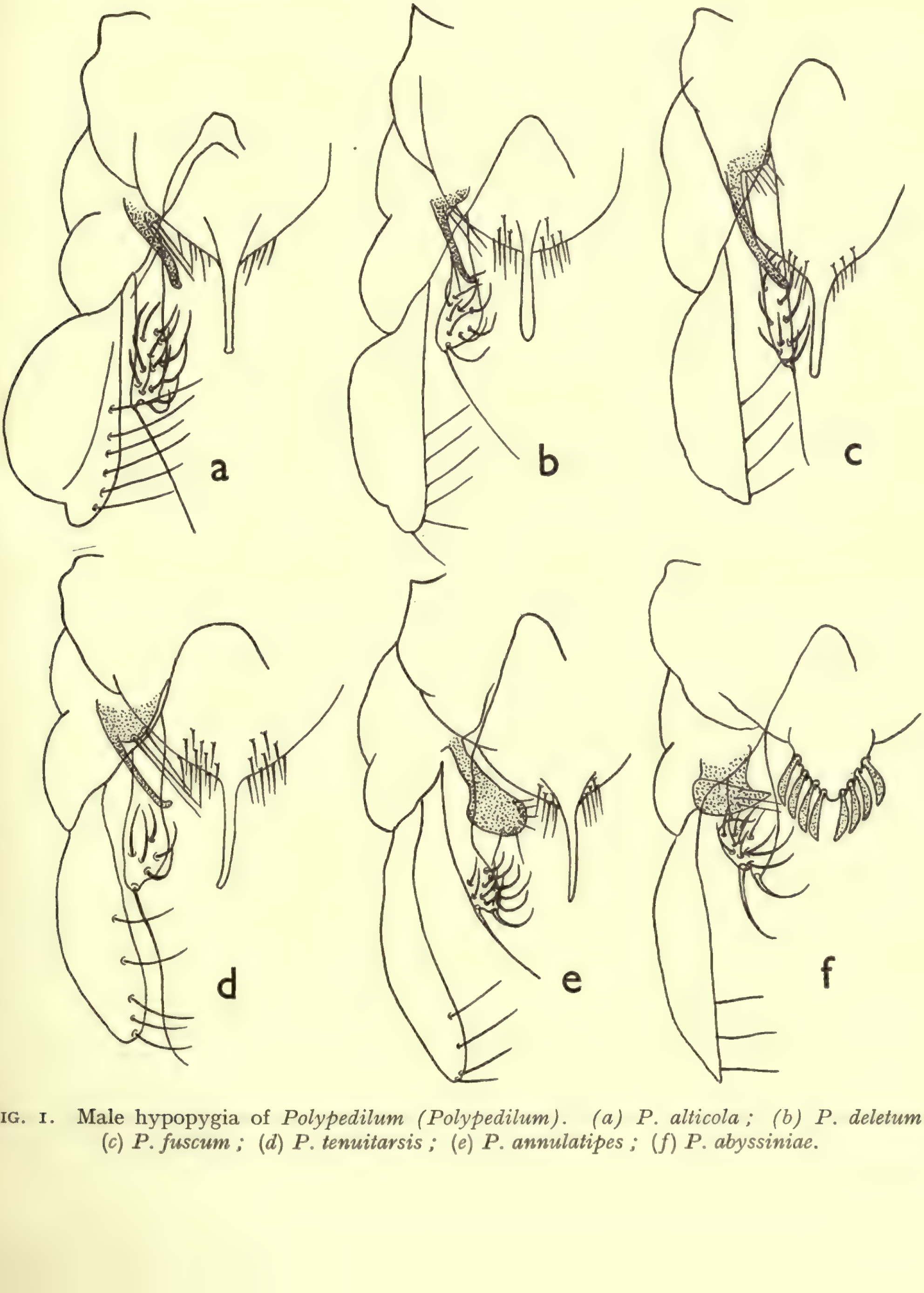

FIG. 1. Male hypopygia of *Polypedilum (Polypedilum)*. *(a) P. alticola; (b) P. deletum; (c) P. fuscum; (d) P. tenuitarsis; (e) P. annulatipes; (f) P. abyssiniae.*

Holotype male in the British Museum (type locality CAPE PROVINCE: Hermanus Waterfall).

DISTRIBUTION. Apart from the type series, I have seen: TRANSVAAL: 1 ♀, Nelspruit, ix.1954 (*A. D. Harrison*); 1 ♂, Sabie-Pilgrim's Rest Road, ix.1954 (*A. D. Harrison*).

Polypedilum (Polypedilum) incoloripenne Goetghebuer

Polypedilum incoloripenne Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 486; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, **83**: 27.

As with *fuscum*, this species is very similar to *deletum* in structure and general appearance. It may be distinguished from both by the absence of all wing markings and by the pale halteres; male hypopygium with styles more pointed as in *fuscum* and proportions more as in that species.

I have seen the holotype male in Musée Royal du Congo Belge, Tervuren (type locality BELGIAN CONGO: Rutshuru).

DISTRIBUTION. The only other specimens known to me are from BELGIAN CONGO: Lac Magera (de Witte).

Polypedilum (Polypedilum) tenuitarsis Kieffer

Kribiomimus leucolabis Kieffer, 1921, *Ann. Soc. ent. France*, **90**: 50 (not *Polypedilum leucolabis* Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1): 98) (SYN. NOV).

? *Kribiocharis filitarsis* Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 2.

Kribiocharis tenuitarsis Kieffer, 1922, *ibid.* **91**: 6.

Polypedilum fenestratum Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 485; Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2**: 376 (SYN. NOV.).

A small pale species with strongly marked wings; thorax yellowish with stripes hardly darker, pleura with a dark stripe, abdomen darker but apices of segments pale, wing markings more or less in form of two bands with an oval clear area at base of cell R_5 and another in fork cell, apex also darkened. Although the types are lost, Kieffer's descriptions of *leucolabis* and *tenuitarsis* leave no doubt that both are earlier descriptions of *fenestratum*; *K. filitarsis* is more doubtful, although it is certainly a *Polypedilum* because of the triangular eighth segment and closely resembles this species, and I prefer to leave it as a query synonym. The name *leucolabis* is preoccupied by a species published two days earlier; I prefer not to follow page precedence but to use the more certain name for the species.

Male. Wing length 1·3–5 mm.

Head yellowish, A.R. 2·5. *Thorax* yellowish, shoulders white, stripes slightly darker, pleura with a median dark stripe. *Legs* mainly yellowish, femora more or less darkened at apex, anterior tibia with sub-basal dark ring and dark at apex, other tibiae may be dark as well; scale with short spur; anterior tarsi missing but probably as in female, i.e. L.R. 2, segment 1 with apical third dark, segments 2–4 with apical half or more dark. *Wings* (Pl. 1, fig. *d* of female) with main marking as a broad band from apical half of R_1 across posterior fork cell and apex of anal cell, leaving a pale spot in fork cell; a second, more poorly developed band reaches from cross-vein to middle of anal cell ; apical band extended in cell M_2 both apically and basally sometimes more or less joined to basal band as shown in figure of female ; apex of wing also with a small dark patch ; base of cell R_5 clear and forming a conspicuous pale spot. Halteres dark. *Abdomen* yellowish brown with variable dark markings, each segment broadly pale apically, styles pale ; hypopygium (Text-fig. 1, *d*) with narrow appendage 1 and anal point, appendage 2 with long apical hair.

Female resembles male but wings more strongly patterned.

The types of *leucolabis*, *filitarsis* and *tenuitarsis* are lost, all were from FRENCH CAMEROONS : Kribi. I have seen the holotype female of *fenestralis* in Musée Royal du Congo Belge, Tervuren (BELGIAN CONGO : Vitshumbi).

DISTRIBUTION. NIGERIA : 1 ♀, Zaria, xi.1956 (*B. McMillan*). SUDAN : 1 ♀, Muklei, v.1953 (*G. S. Rennie*) ; series of ♀♀ from Amadi, Yirol, Wau and Tonga, 1952–54 (*E. T. M. Reid*. BELGIAN CONGO : 1 ♂, 1 ♀, Maka Lualaba, i.1939 (*H. J. Brédo*) ; 1 ♂, Elisabethville, xii.1938 (*H. J. Brédo*). TRANSVAAL : 1 ♀, Letaba, v.1951 (*P. Brinck*). The type localities are additional.

Polypedilum (Polypedilum) annulatipes Kieffer

Polypedilum annulatipes Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 100 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 30.

? *Polypedilum octostictum* Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 101 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 39.

Polypedilum octomaculatum Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* **25** : 195 ; Goetghebuer, 1936, *ibid.* **28** : 488 (SYN. NOV.).

A small dark species with wing pattern not unlike *tenuitarsis* but the cross-vein and basal cells are quite clear and there is a discrete spot in the apical half of cell R_5 ; male hypopygium with appendage 1 clubbed. *P. annulatipes* is easy to recognize from Kieffer's description and *octomaculatum* at any rate must fall as a synonym. The description of *octostictum* is not quite so certain, but the resemblance is strong and it probably is another synonym. The wing pattern resembles *allansoni* (see below) but the male hypopygium is quite different.

Male. Wing length 1·5–1·8 mm.

Head and mouthparts dark brown, antennae paler, A.R. about 2. *Thorax* dark brown or blackish and pruinose, pruinosity of hair lines and stripes changeable ; dorsocentral bristles pale and uniserial. *Legs* yellowish brown, the femora being the darkest part with tips blackish and with a subapical pale band which is progressively wider from front to back legs ; L.R. 2, anterior tarsus not bearded, scale triangular and with sharp point. *Wings* (Pl. 1, fig. *e* of female) with a broad band as shown and separate spots in cell R_5, anal cell and below posterior fork ; there may be additional darkening at the apex of fork cell and the area of darkening in cell M_2 may be more extended basally but it does not reach basal to cross-vein. Halteres pale. *Abdomen* black ; hypopygium (Text-fig. 1, *e*) with narrow styles, anal point elongate, appendage 1 club-shaped.

Female very similar to male ; some specimens from Gold Coast have wing length only 1·0 mm.

The holotype male of *annulatipes* (locality BELGIAN CONGO: Go) and holotype female of *octosticum* (FRENCH CAMEROONS: Kribi) are both lost. I have seen the holotype male of *octomaculatum* in Musée Royal du Congo Belge, Tervuren (locality BELGIAN CONGO: Kisantu).

DISTRIBUTION. GOLD COAST: 13 ♀, Kete Krachi, x.1898 (*Graf Zech*). NIGERIA: 2 ♀, Abuja, xii.1954 (*R. W. Crosskey*); 1 ♂, Katsina, x.1956 (*B. McMillan*). SUDAN: 2 ♀, Amadi, vii.1954 (*E. T. M. Reid*). BELGIAN CONGO: 1 ♂, Banana (*H. Schouteden*); 1 ♀, Elisabethville, xii.1938 (*H. J. Brédo*); holotype of *octomaculatum*, Kisantu. S. RHODESIA: 1 ♂, 5 ♀, Salisbury, v.1956 (*E. T. M. Reid*). TRANSVAAL: 3 ♂, Pongola R. Settlements, ix.1954 (*A. D. Harrison*). NATAL: 1 ♀, Weenen, x.1924, (*H. P. Thomasset*).

Polypedilum (Polypedilum) abyssiniae Kieffer

Polypedilum abyssiniae Kieffer, 1918, *Ann. Mus. nat. Hung.* **16** : 65.

Polypedilum niveiforceps Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 101 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 41 (SYN. NOV.) ; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, **83** : 26.

Polypedilum novemguttatum Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 101 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 42 (SYN. NOV.).

A small dark species with patterned wings; there is a spot basal to the cross-vein as in *longicrus* and *griseoguttatum* but it may be distinguished from these by the clear base to cell R_5 and by the smaller spot behind the apex of R_{4+5}. Male anal point unusual, it is conical and with broad flattened spines each side. I was able to see the type of *abyssiniae*; the other two belong here judging from the wing pattern and the male genital structure of *niveiforceps*.

Male. Wing length 1·5 mm.

Head blackish, mouthparts brown, A.R. about 1·4. *Thorax* very dark brown, prescutellar area quite strongly pruinose, lines of bristles also pruinose. *Legs* yellowish brown, apices of femora darkened; tibial scale oval and with a short spur, L.R. 2. *Wings* (Pl. 1, fig. *f* of female) with markings very similar to the female but not always as intense, spot at apex of fork cell sometimes almost absent; important features are the two markings in cell R_5 and the spot basal to cross-vein. Halteres pale. *Abdomen* black, styles pale; hypopygium (Text-fig. 1, *f*) usually with broad conical anal point fringed with 4–5 flattened spines each side, but it may be more square than conical in some specimens; appendage 1 with broad apex which is flattened, turned up and produced inwardly, appendage 2 also broad and with about 12 curved hairs at the apex; some specimens from L. Tanganyika have the hairs on appendage 2 greatly reduced, only 3–4 being present.

Female resembles male, wing pattern usually more intense (Pl. 1, fig. *f*).

I have seen a cotype female of *abyssiniae* which was in the Hungarian National Museum (locality ABYSSINIA: Lake Dembel); the type series of *niveiforceps* (SUDAN: Shambe) and of *novemguttatum* (SUDAN: Mongola) are lost.

DISTRIBUTION. ETHIOPIA: cotype female, Lake Dembel. SUDAN: series taken at light on river steamer, Adok, Melut, Shambe, xi.1953 (*E. T. M. Reid*). BELGIAN CONGO: 23 ♂, 22 ♀, Parc National Albert (*H. Damas*); 5 ♂, Kabimba

(L. Tanganyika), viii.1953 (*J. Verbeke*). TANGANYIKA: 5 ♂, 2 ♀, Kigoma, L. Tanganyika, viii.1956 (*P. S. Corbet*). TRANSVAAL: 1 ♂, Hartebeestpoort Dam, iv.1957 (*B. R. Allanson*); 1 ♂, Kruger National Park, v.1957 (*A. D. Harrison*).

Polypedilum (Polypedilum) quinqueguttatum Kieffer

Polypedilum quinqueguttatum Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1): 100; Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 32.
Polypedilum septemguttatum Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1): 100; Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 32 (SYN. NOV.).
Polypedilum sexguttatum Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1): 100; Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 35 (SYN. NOV.).
Kribiophilus pictipennis Kieffer, 1922, *ibid.* **91**: 43 (SYN. NOV.).
Polypedilum niloticum Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, **1924**: 271 (SYN. NOV.).

This and the next two species are small brown species very similar in general appearance and wing pattern but readily distinguished by the male hypopygium; in the present species the anal point is extremely narrow and set on a conical IXth tergite, also appendage 2 has about 12 curved hairs. Wings of all three species with well-formed spots at base of M_{1+2}, in centre of cell R_5, over Cu and in centre of anal cell; in *quinqueguttatum* there are also spots at the apices of both branches of M and no spot basal to the cross-vein. I have not seen the types of any of Kieffer's species but the descriptions, with characteristic wing pattern leave no doubt about their identity.

Male. Wing length 1·3–1·5 mm.

Head and mouthparts brown, A.R. about 1·1. *Thorax* brown or dark brown, with some pruinosity especially in the prescutellar area. *Legs* yellowish, femora darker basally; tibial scale oval and with very small spur, L.R. 1·8. *Wings* (Pl. 1, fig. *g* of female) with six spots which are smaller than in *longicrus* and there is not one basal to cross-vein, sometimes spots rather faint. Halteres with brown or dark knobs. *Abdomen* black, styles pale. Hypopygium (Text-fig. 2, *a*) with characteristic narrow anal point set on conical IXth tergite; appendage 1 foot-shaped, appendage 2 with about 12 hairs.

Female resembles male.

The types of all species are lost, the first four were all described from FRENCH CAMEROONS: Kribi, with only *sexguttatum* being known in the male; *niloticum* was described from a male from EGYPT: Maadi.

DISTRIBUTION. NIGERIA: 2 ♀, Abuja, xii.1954 (*R. W. Crosskey*). SUDAN: 3 ♀, Khartoum, x.1951 (*D. J. Lewis*); 6 ♂, 2 ♀, Amadi, vi–vii.1954 (*E. T. M. Reid*). NATAL: 1 ♂, Tugela R., Ngobevu, iii.1954 and 1 ♂, 1 ♀, Jameson's Drift, iv.1954 (*W. D. Oliff*). With the type localities this species has a very wide distribution.

Polypedilum (Polypedilum) longicrus Kieffer

Polypedilum longicrus Kieffer, 1921, *Ann. Soc. sci. Brux* **41** (1): 101; Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 40.
Polypedilum duodecimpustulatum Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 484 (SYN. NOV.); Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, **93**: 27 (not Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2**: 377—see *P. tropicum*).

A small species with patterned wings, differing from *quinqueguttatum* and *tropicum* only in the wing pattern and male hypopygium. Wings (Pl. 1, fig. *h*) have some apical grey clouding around the margin, a spot basal to the cross-vein and a grey tract between M_{1+2} and M_{3+4}, in addition to the four main spots which are present in all three species. Anal point of male (Text-fig. 2, *b*) short and stout and strongly bent downwards, IXth tergite broad, the whole appearance being more like *tropicum* than *quinqueguttatum* ; appendage 2 carries about six curved hairs and appendage 1 is curved.

The identity of *longicrus* is quite certain from the original description although the type is lost (type locality BELGIAN CONGO : Go) ; I have seen the holotype of 12-*pustulatum* in Musée Royal du Congo Belge, Tervuren and can confirm the synonymy (type locality BELGIAN CONGO : Vitshumbi).

DISTRIBUTION. GOLD COAST : 1 ♂, 2 ♀, Nangodi, x.1954 (*G. Crisp*). SUDAN : numerous specimens, Rier, Khartoum, Wad Medani, Shambe, Wau (*D. J. Lewis, S. Hirst, E. T. M. Reid*). UGANDA : 1♂, Nimule, viii.1911. BELGIAN CONGO : 2 ♂, Kamande (*H. Damas*) ; 3 ♂, Elisabethville, iii.1939 (*H. J. Brédo*). The type localities are additional.

Polypedilum (Polypedilum) tropicum Kieffer

Polypedilum tropicum Kieffer, 1913, *Voy. All. Jean. Afr. Or. Ins. Dipt.* **1** : 21.

Polypedilum trilobatum Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 100 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 34 ; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, **83** : 27 (SYN. NOV.).

Polypedilum ? *duodecimpustulatum* Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2** : 377 (not Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 484).

This species, again, can only be distinguished from *quinqueguttatum* and *longicrus* by the wing markings (Pl. 1, fig. *i*) and the male hypopygium (Text-fig. 2, *c*). Wings with four large spots and a slight grey tract between the branches of M ; no spot basal to cross-vein. Hypopygium with a three-lobed anal point, appendage 2 narrow and with only three, well spaced, hairs ; appendage 1 slightly curved outwards.

I have seen the holotype female of *tropicum* in Muséum National d'Histoire Naturelle, Paris (type locality KENYA : Taveta) ; the male hypopygial structure agrees exactly with the figure given by Kieffer in his description of *P. trilobatum*, the type series of which is lost (type locality SUDAN : Mongola).

DISTRIBUTION. NIGERIA : 4 ♀, Abuja, xii.1954 (*R. W. Crosskey*). SUDAN : 2 ♀, Amadi and 1 ♀, Juba, vi–vii.1954 (*E. T. M. Reid*). BELGIAN CONGO : 1 ♂, May-ya-Moto (*de Witte*). TRANSVAAL : 1 ♂, Pongola Settlements, ix.1954 (*A. D. Harrison*) ; 1 ♀, Skukuza, v.1955 (*A. D. Harrison*). BASUTOLAND : 1 ♀, Makhake Mts. (*P. Brinck*). CAPE PROVINCE : 5 ♀, Tzitzikama Forest (*P. Brinck*).

Polypedilum (Polypedilum) pruina Freeman

Polypedilum pruina Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 179 ; Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2** : 376.

Very similar to the preceding three species but easily distinguished by the presence of three distinct spots in cell R_{4+5} and by the male hypopygium which is more like that of *aegyptium*.

Male. Wing length 1·3–1·5 mm.

Head, mouthparts and antennae brown, A.R. hardly more than 1. *Thorax* dark brown and pruinose especially in prescutellar area, pruinosity changes on to stripes when direction of light changes. *Legs* yellowish, basal two-thirds of femora darker, anterior legs whitish and with tarsal segments 2–5 darker basally, L.R. about 1·75, scale oval and with short spine at apex. *Wings* (Pl. 1, fig. *j* of female) with three spots in cell R_5, other spots very similar to those of *quinqueguttatum*, no spot basal to cross-vein; halteres with brown knobs. *Abdomen* blackish; hypopygium (Text-fig. 2, *d*) with anal point broad and downturned and with lateral teeth basally of variable length giving a trilobed appearance; appendage 1 with two long strong inwardly pointing spines and a curved apical one; appendage 2 with about 6–7 apical hairs.

Female resembles male.

Holotype male in the British Museum (type locality CAPE PROVINCE: Piquetberg).

DISTRIBUTION. CAPE PROVINCE: type locality; 7 ♂, Upington, xi.1950 (*P. Brinck*). NATAL: 1 ♀, Weenen, x.1924 (*H. P. Thomasset*); 1 ♂, Mooi River, Keate's Drift, iv.1954 (*W. D. Oliff*). SUDAN: 1 ♂, Amadi, vi–vii.1954 (*E. T. M. Reid*). NIGERIA: 1 ♂, Kankiya, xii.1956–i.1957 (*B. McMillan*).

Polypedilum (Polypedilum) aegyptium Kieffer

Polypedilum aegyptium Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, **1924**: 270 (*Polypedilum iris* on the figure—*laps. cal.*).
Polypedilum iris Goetghebuer, 1937, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*): 61 (in part).
Polypedilum aïrense Freeman, 1956, *Bull. I. F. A. N.* **18** (A): 96 (SYN. NOV.).

A small dark species, easily separated from all except the next by the faint wing markings; separated from *subovatum* sp. n. by the quite different male hypopygium.

Although the type series is lost, the species can be recognized from the description and figure of the male hypopygium which Kieffer unfortunately labelled as belonging to his previous species (*iris*). This is clearly an error because *iris* is described from the female only. Goetghebuer (1937) followed this error and redescribed *iris* with *aegyptium* hypopygium. I described *aïrense* before I had appreciated the identity of *aegyptium*, and it must fall as a synonym.

Male. Wing length 1·4–1·6 mm.

Head, mouthparts and antennae brown, A.R. about 1·2. *Thorax* dark brown and pruinose, shoulders slightly paler. *Legs* yellowish brown, tibial scale conical and with short spur, L.R. 1·75. *Wings* (Pl. 1, fig. *k* of female) with a faint cloud at the base of cell R_5, more or less connected to a similar cloud in base of fork cell and apex of anal cell and with another cloud placed centrally in the anal cell; long veins sometimes faintly seamed with grey, cell R_5 occasionally with a faint cloud at the apex. Halteres pale or with brownish knobs. *Abdomen* black; hypopygium (Text-fig. 2, *e*) very similar to *pruina* but appendage 1 more angular and only one inner spine present, appendage 2 with more hairs.

Female resembles male, tibiae may have dark apices.

Type series lost (locality EGYPT : Maadi). Holotype male of *aïrense* in Institut francais d'Afrique noire, Dakar (locality FRENCH WEST AFRICA : Niger, Aïr).

DISTRIBUTION. EGYPT : 1 ♂, Moascar, ii.1942 (*J. W. S. Macfie*). SUDAN : 1 ♂, 1 ♀, Merowe (*S. Hirst*) ; 8 ♂, 7 ♀, Wad Medani, ii.1952 (*D. J. Lewis*) ; 1 ♀, Rier, ii.1946 (*D. J. Lewis*). FRENCH WEST AFRICA : Niger, Aïr, type series of *aïrense*.

Polypedilum (Polypedilum) subovatum sp. n.

In colour, general structure and wing pattern, exactly similar to *aegyptium* but easily separated by the male genital structure. Anal point lacking lateral teeth (Text-fig. 2, *f*), appendage 1 much broader and ovate with 6 long hairs, appendage 2 with about 18 curved hairs.

Female not known.

Holotype male, CAPE PROVINCE : Berg River, Driefontein, 17.xii.54 (*K. M. F. Scott*) in the British Museum.

Polypedilum (Polypedilum) tridens Freeman

Polypedilum tridens Freeman, 1955, *Explor. Parc Nat. Albert.* Miss. de Witte, **83** : 28.

A wide-spread, small, dark species with plain wings and dark halteres ; anal point of male trifid and whole hypopygium very similar to others with this character especially *allansoni*, but easily separated from them by the plain wings ; the female is difficult to distinguish from other dark, plain-winged species although the dark halteres are sometimes helpful.

Male. Wing length 1·5 mm.

Head, mouthparts and antennae dark brown, A.R. about 1·5. *Thorax* dark brown, paler on the shoulders, pruinose on shoulders and between stripes. *Legs* yellowish, tibial scale triangular and with a well-formed black spine at apex, L.R. 2. *Wings* unmarked or veins very slightly seamed with grey ; halteres with dark knobs. *Abdomen* blackish ; hypopygium (Text-fig. 2, *g*) with anal point short, broad and arched and with a short lateral pointed lobe on each side ; appendage 1 short broad and pubescent with a larger spine projecting inwardly ; appendage 2 with 8–9 curved hairs in two rows.

Female resembles male.

Holotype male in collection of Institut des Parcs nationaux du Congo Belge (type locality BELGIAN CONGO : Rutshuru).

DISTRIBUTION. EGYPT : 6 ♂, 3 ♀, Moascar, ii–iii.1942 (*J. W. S. Macfie*). SUDAN : 7 ♂, 2 ♀, Shambe, Adok and Rumbek (*E. T. M. Reid*). ABYSSINIA : 1 ♂, 2 ♀, Waldia, i–ii.1939 (*J. W. S. Macfie*). NIGERIA : 5 ♂, Zaria, xi.1956 (*B. McMillan*). FRENCH WEST AFRICA : 15 ♂, 4 ♀, Haute Volta, nr. Banfora, xii.1956 (*J. Hamon*). UGANDA : 1 ♂, Jinja, i.1956 (*P. S. Corbet*). BELGIAN CONGO : type series from Parc National Albert ; 30 ♂, 9 ♀, Maka Lualaba, i.1939 (*H. J. Brédo*) ; 9 ♂, 11 ♀, Elisabethville, xii.1938–iv.1939 (*H. J. Brédo*) ; 1 ♂, Eala, i.1935 (*J. Ghesquière*).

TRANSVAAL: 1 ♂, Blyde River, ix.1954 (*A. D. Harrison*). NATAL: 5 ♂, 3 ♀, Estcourt, ix.1953 (*A. D. Harrison*); 1 ♂, Scottburgh, vii.1953 (*K. M. F. Scott*).

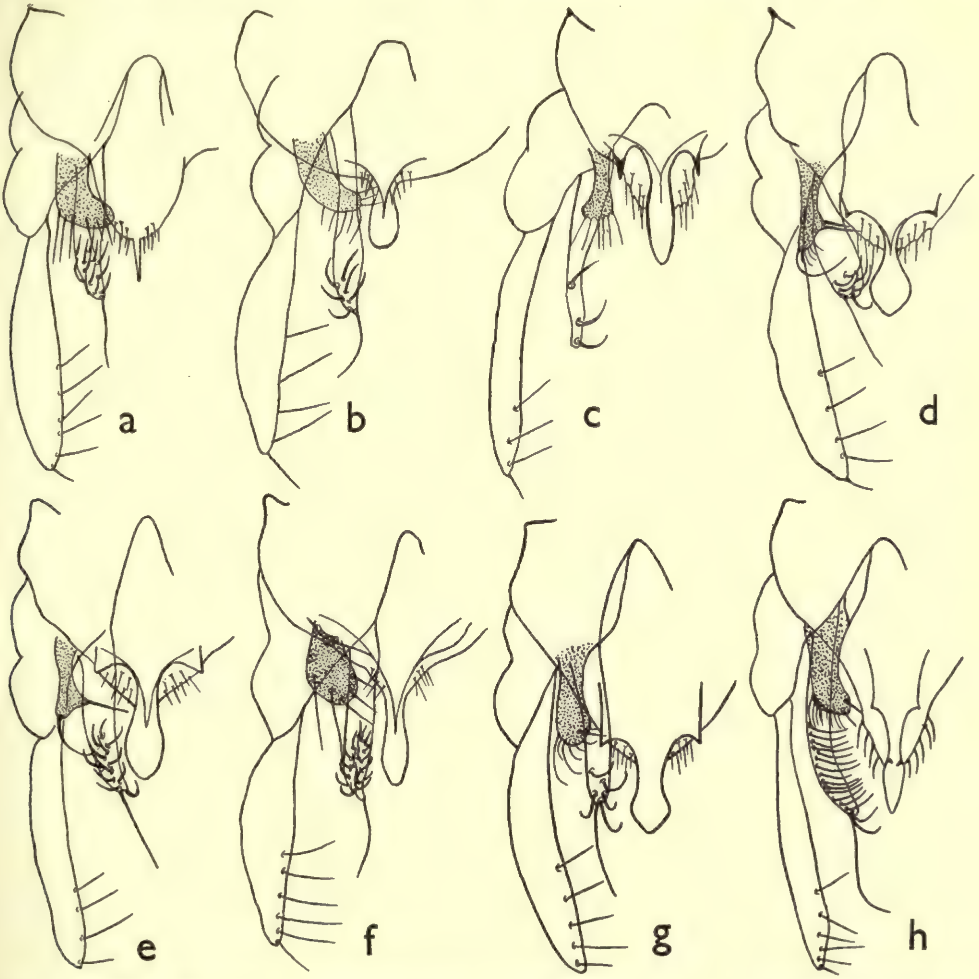

FIG. 2. Male hypopygia of *Polypedilum (Polypedilum)*. *(a) P. quinqueguttatum; (b) P. longicrus; (c) P. tropicum; (d) P. pruina; (e) P. aegyptium; (f) P. subovatum; (g) P. tridens; (h) P. griseoguttatum.*

Polypedilum (Polypedilum) allansoni sp. n.

A small dark species with pruinose thorax, femora with subapical clear band, wings with dark spots; the wing pattern is very similar to *annulatipes* but the grey tract in cell M_2 is separated into two spots; it is best separated from *annulatipes* by the structure of the male hypopygium in which the anal point is trifid and is very similar to *tridens*.

Male. Wing length 1·5 mm.

Head, mouthparts and pedicel dark brown, flagellum paler, A.R. about 1. *Thorax* dark brown and pruinose, especially in the prescutellar area. *Legs* mainly pale brown, but femora darker and with a subapical pale band, L.R. 1·75. *Wings* with pattern very similar to that of *annulatipes* (Pl. 1, fig. *e*) but the tract in cell M_2 is present as two separate spots, one slightly basal to the larger spot in cell R_5, the other slightly basal to the smaller spot in that cell ; apex of fork cell clear. *Abdomen* dark brown, styles yellowish. Male hypopygium hardly to be distinguished from that of *tridens* (Text-fig. 2, *g*), anal point almost identical, appendage 1 with rather fewer hairs.

Female not known.

Holotype male and 4 ♂ paratypes, TRANSVAAL : Blaauwbank River, near Sterkfontein caves, iv.1957 and 1 ♂,iii.1957 (*B. R. Allanson*). All specimens are in the British Museum.

Polypedilum (Polypedilum) griseoguttatum Kieffer

Polypedilum griseoguttatum Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 100 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 36.

Polypedilum hieroglyphicum Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 101 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 38 (SYN. NOV.).

Polypedilum decem-maculatum Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* **25** : 195 (SYN. NOV.).

Polypedilum van-bemmeli Kruseman, 1949, *Bijdr. Dierk.* **28** : 254 (SYN. NOV.).

A small- to medium-sized dark species with strongly marked wings ; thorax and abdomen with pruinosity, wing markings of variable intensity but include three dark markings of variable shape in cell R_5 and a spot basal to cross-vein ; male hypopygium with IXth tergite drawn out, anal point more or less trifid. The only type I have been able to see is that of *decem-maculatum*, but the wing markings and the male hypopygium are so distinctive that I have no hesitation in giving the above synonymy.

Male. Wing length 1·5–2·5 mm., specimens from Sudan and Egypt are smaller than those from further south.

Head dark brown, mouthparts and antennae paler brown, A.R. about 2. *Thorax* dark brown, lines of bristles paler, whole mesonotum pruinose, pruinosity of stripes and prescutellar area changeable with the direction of light ; scutellum may be yellowish. *Legs* with all femora brown on basal three–quarters or more, apex yellow ; front and posterior tibiae yellow, middle tibiae brown ; tarsi yellow, anterior basitarsus completely yellow, all other segments with basal quarter or more brown ; L.R. varying from 1·5–2·0, scale of anterior tibiae triangular and with a well-developed sharp spur. *Wings* (Pl. 1, figs. *l–o* of females) strongly marked with a complicated pattern ; there is a spot basal to cross-vein and cell R_5 always has three markings but these vary in shape in different localities, the two apical ones are usually more diffuse but they may be discrete. *Abdomen* blackish, hypopygium partially yellow, each segment either pruinose on apical half or with pruinose band divided into two separate spots ; hypopygium (Text-fig. 2, *h*) with characteristic conical IXth tergite ; anal point with lateral teeth of variable size, apex curved downwards and arched, sometimes with side notches as shown ; appendage 1 stout and with two small inner spines, appendage 2 may have the curved hairs in a single row or they may be grouped nearer the apex ; styles elongate.

Female similar to male.

The type series of *griseoguttatum* (FRENCH CAMEROONS : Kribi) and of *hieroglyphicum* (SUDAN : Shambe) are lost ; I have seen the holotype male of *decemmaculatum* in Musée Royal du Congo Belge, Tervuren (BELGIAN CONGO : Kisantu) ; the holotype male of *van-bemmeli* is in the Zoological Museum, Amsterdam (EGYPT : Suez Canal).

DISTRIBUTION. EGYPT : 3 ♂, 1 ♀, Suez Canal, x.1934 (*F. W. Edwards*). SUDAN : 14 ♂, 1 ♀, at light on steamer, Melut and Shambe, xi.1953 (*E. T. M. Reid*) ; 3 ♂, 1 ♀, Wau, x.1952 (*E. T. M. Reid*) ; 2 ♂, Rier, ii.1946 (*D. J. Lewis*). GOLD COAST : 1 ♀, Nangodi, x.1954 (*G. Crisp*). FRENCH CAMEROONS : 1 ♀, Douala (*J. Rageau*). TANGANYIKA : 1 ♂, Uvira, vii.1931 (*T. D. A. Cockerell*) ; 4 ♂, 4 ♀, Kigoma, viii.1956 (*P. S. Corbet*). BELGIAN CONGO : 1 ♂, Kasenyi (L. Albert) and Kabimba (L. Tanganyika), viii.1953 (*J. Verbeke*) ; 6 ♂, Sabe, xii.1953 ; 4 ♀, Elisabethville, xii.1938 (*H. J. Brédo*). N. RHODESIA : 1 ♂, Luangwa River, viii.1930 (*S. A. Neave*). MADAGASCAR : 1 ♀, Tananarive, v.1956 (*J. Hamon*).

Polypedilum (Polypedilum) ramiferum Kieffer

Polypedilum ramiferum Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 98 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 24.

Polypedilum brevipecten Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 99 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 27 (SYN. NOV.).

Wings either faintly clouded or with well-formed clouds ; legs marked with black and yellow, abdomen with tergite 5 and sometimes 4 and 6 pale, styles of male hypopygium with long plumose hairs. Very similar to the next species from which it can be separated by the male hypopygium and the less intense leg and wing markings. The descriptions given by Kieffer and his figures of the male leave no doubt that both of his species are the same and are correctly identified as this one, even though he considered the wings to be plain ; the wing markings are often difficult to see in spirit material.

Male. Wing length 2–3 mm.

Head, mouthparts and antennae brown, A.R. about 1. *Thorax* brown and rather shining though with some pruinosity in certain lights ; dorso-central bristles bi- or triserial, long and brown. *Legs* dark brown or blackish, femora with a darker subapical ring ; base and apex of tibiae and of tarsal segments yellow ; middle and posterior tibiae usually with an additional broad yellow central band which may eliminate the sub-basal dark area so that the basal half or more of the tibia is yellow ; L.R. about 1·75 ; tibial scale triangular and with a curved spur at the apex. *Wings* (Pl. 1, fig. *p* of female) with pattern either faint or well developed, not unlike *albosignatum* ; halteres yellow or brown. *Abdomen* brown, each segment with pale posterior band ; at least segment 5 and often either 4 or 6 as well, pale and with pale hair. Hypopygium (Text-fig. 3, *a*) quite unlike any other African species known to me because the hairs along the inner margin of the style are very long and plumose; anal point long and narrow, appendage 1 broad basally, sharply contracted and bent at the middle, apical half narrow and straight, appendage 2 long.

Female resembles male, wing markings usually more definite.

Types of both species lost (both were described from males from FRENCH CAMEROONS: Kribi).

DISTRIBUTION. SUDAN: 5 ♂, Khartoum, xi.1951 (*D. J. Lewis*); 1 ♀, Amadi, vi–vii.1954 (*E. T. M. Reid*). NIGERIA: 1 ♀, Minna, xii.1954 (*R. W. Crosskey*). UGANDA: 12 ♂, 3 ♀, Jinja, x.1954 (*P. S. Corbet*). BELGIAN CONGO: 1 ♂, Kusenyi (L. Albert), ii.1953 (*J. Verbeke*); 20 ♂, Albertville, viii.1953 (*J. Verbeke*). The type locality is additional.

Polypedilum (Polypedilum) albosignatum Kieffer

Polypedilum albosignatum Kieffer, 1925, *Bull. Soc. R. ent. Égypte*, **1924**: 268.
Polypedilum iris Kieffer, 1925, *ibid.* **1924**: 269; Goetghebuer, 1937, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*): 61 (in part) (SYN. NOV.).

Wing markings and general appearance similar to *ramiferum*, differing in detail and intensity, segment 5 of abdomen brown, male hypopygium quite different, anal point short and thick, appendage 1 reduced. Kieffer separated his two species because *albosignatum* had only one spot in the anal cell whereas *iris* had two; but he stated that the wing base of the former was subhyaline which suggests that the spot was really there. However, whether such a spot is there or not is immaterial in species with these nebulous markings and I am regarding his two species as synonyms. As mentioned under *aegyptium*, Kieffer labelled the figure of *aegyptium* as "*iris*" in error and Goetghebuer followed this mistake.

Male. Wing length 1·5–2·0 mm.

Head, mouthparts and antennae brown, A.R. about 1·4. *Thorax* brown, scarcely shining and with slight pruinosity, dorso-central bristles more or less uniserial, long and brown. *Legs* yellowish brown, femora darker on basal half and dark at apex, tibiae vaguely darkened basally and apically, tarsi without dark markings; L.R. 2; tibial scale triangular and with short spur. *Wings* (Pl. 1, fig. *q* of female) with pattern not unlike *ramiferum*, not very intense, pale areas more confined; halteres brown. *Abdomen* brown, each segment with a pale apical ring, segment 5 dark; hypopygium (Text-fig. 3, *b*) with short stout anal point, appendage 1 short and with 3 long hairs at the apex, appendage 2 narrow and with only 4–6 hairs at the apex, style hairs not plumose.

Female similar to male, wing markings more intense.

Type series of both species lost, both were described from females from EGYPT: Maadi.

DISTRIBUTION. SUDAN: 2 ♂, 3 ♀, Khartoum, i.1923 (*S. Hirst*); 8 ♂, 3 ♀, Khartoum, x.1951 (*D. J. Lewis*); 1 ♂, 3 ♀, Liednum nr. Wau, iii–iv.1955 (*E. T. M. Reid*). UGANDA: 25 ♂, Kagera R., iv.1955 (*P. S. Corbet*). The type locality gives it a distribution overlapping into the Palaearctic Region.

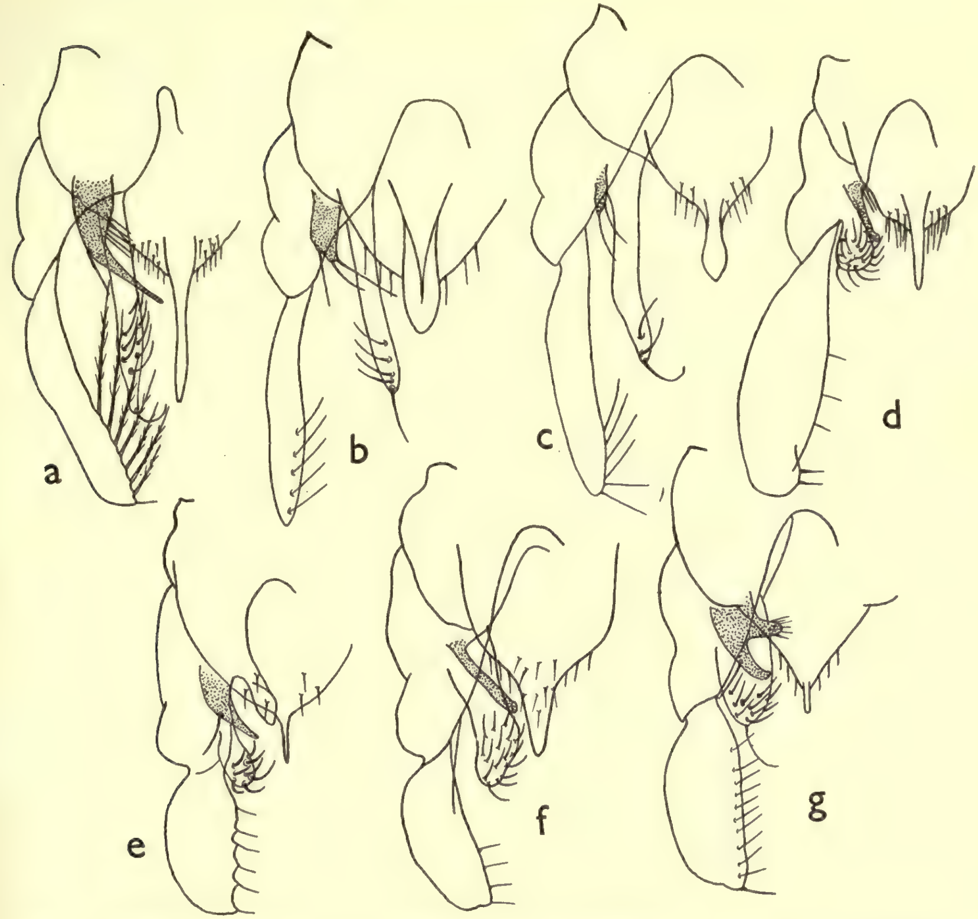

FIG. 3. Male hypopygia of *Polypedilum (Polypedilum)*. *(a) P. ramiferum ; (b) P. albosignatum ; (c) P. alboguttatum ; (d) P. fuscipenne ; (e) P. declivis ; (f) P. lobiferum ; (g) P. longinervis.*

Polypedilum (Polypedilum) alboguttatum Kieffer

Polypedilum alboguttatum Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 99 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 29.

Wings black or very dark brown with 10–11 small clear spots, legs mainly black, tarsi marked with yellow. Hypopygium of similar type to *albosignatum*, but the wing markings are much more intense and make the species readily recognizable.

Male. Wing length 1·5 mm.

Head, mouthparts and antennae brown, A.R. 1·5. *Thorax* mottled pale brown, strongly pruinose on shoulders and prescutellar area, dorso-central bristles uniserial, postnotum blackish. *Legs* with femora and tibiae black, femora with a broad pale band in basal half, knees with a spot of yellow, tarsi much paler, segments marked with brown on basal halves ; L.R. 2·2, scale triangular, sharply pointed. *Wings* (Pl. 1, fig. *r* of female) blackish or very dark brown with 10–11 small clear spots ; main pattern not unlike *albosignatum* but details and intensity different ; halteres with black knobs. *Abdomen* black, each segment with a pale pruinose band apically, styles whitish ; hypopygium (Text-fig. 3, *c*) of same general form as *albosignatum* but appendage 1 more reduced, appendage 2 with fewer apical hairs, anal point broad and strongly bent downwards.

Female similar to male, cerci yellow.

Type series lost, described from 6 females from SUDAN : Shambe.

DISTRIBUTION. SUDAN : 2 ♂, 17 ♀, Melut, xi.1953 (*E. T. M. Reid*) ; 1 ♂, 2 ♀, Liednum nr. Wau, iii-iv.1955 (*E. T. M. Reid*). UGANDA : 2 ♀, L. Albert, iii.1954 (*P. S. Corbet*) ; 2 ♀, Albert Nile at Pakwach, iv.1956 (*P. S. Corbet*).

Polypedilum (Polypedilum) fuscipenne Kieffer

Polypedilum fuscipenne Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 98 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 22.

Tripedilum armatifrons Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 47 (SYN. NOV.)

Polypedilum longiforceps Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 98 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 23 (SYN. NOV.).

Microtendipes longiventris Kieffer, 1922, *ibid.* **91** : 15 (SYN. NOV.).

Reddish with black antennal plumes and dark abdomen, thorax shining and sometimes with variable dark markings, especially in the female ; frons produced into two lobes each bearing a small frontal tubercle ; wings without distinct markings; male styles large and long, anal point short, coxites produced ventrally. The frontal tubercles and general colour characters make it quite certain that I have identified *armatifrons* correctly ; *fuscipenne* seems to have been described from a dark female, whilst *longiforceps* and *longiventris* can be recognized from the figures of the male hypopygia. The name *fuscipenne* was published two days earlier than *armatifrons*.

Male. Wing length 2·3–3·0 mm.

Head reddish yellow, mouthparts darker, antennae with blackish plumes and reddish pedicel, A.R. about 2·75 ; frons with two conical lobes carrying the small frontal tubercles at their extremities. *Thorax* shining reddish yellow, sometimes with indications of a dark lateral pleural stripe, stripes rather more reddish than remainder of thorax, postnotum more or less dark. *Legs* yellow, apices of anterior femora and tibiae and of tarsal segments darkened, tarsus not bearded, L.R. 2·3 ; scale triangular and carrying a strong black spine as long as the scale itself. *Wings* without distinct markings but slightly darker or yellowish along costal margin ; halteres blackish or brown. *Abdomen* blackish and shining, each segment may have a variable amount of browner colouring in basal half ; hypopygium (Text-fig. 3, *d*) with long stout styles and short anal point, appendages both small, 2 without long apical hair, inner margins of coxites produced ventrally and fringed to resemble a third appendage (not shown in the figure).

Female resembles male, but darker ; head may be brown, thoracic stripes partially or completely black, wings more strongly tinted and abdomen often quite black.

Type series of all four species lost ; *armatifrons* was described from females and *longiventris* from males from FRENCH CAMEROONS : Kribi ; *fuscipennis* from a female from SUDAN : Shambe and *longiforceps* from males from SUDAN : Mongola and Shambe.

DISTRIBUTION. SUDAN : 12 ♂, 7 ♀, Yirol, iii–vii.1954 (*E. T. M. Reid*) ; 3 ♂, Wau, iii–iv.1955 (*E. T. M. Reid*). GOLD COAST : 3 ♂, 7 ♀, Nangodi, x.1954 (*G. Crisp*). NYASALAND : 3 ♂, Karonga, SW. shores L. Nyasa, vii.1910 (*S. A. Neave*). BELGIAN CONGO : 7 ♀, Maka Lualaba, i.1939 (*H. J. Brédo*) ; 8 ♀, Elisabethville, ii.1939 (*H. J. Brédo*).

Polypedilum (Polypedilum) declivis Kieffer

Kribionympha declivis Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 7 ; Freeman, 1957, *Mém. Inst. Sci. nat. belg.* **8** : 198.

Thorax yellowish and with a central dark stripe; head and abdomen blackish, legs yellow, scale triangular, wings unmarked, male hypopygium with short styles and three well-formed appendages. The presence of frontal tubercles separates this species from all except *fuscipenne* and *lobiferum* ; from these it may be separated as shown in the key and by the male hypopygium.

Male. Wing length 2·3 mm. (one specimen).

Head, mouthparts and antennae brown, frontal tubercles present but do not appear to be raised on conical lobes, A.R. about 2·2. *Thorax* pale yellowish, the single specimen available to me has a central brown line along the line of the acrostichal bristles, broadening posteriorly and also postnotum and sternopleuron brown. *Legs* yellow, scale yellow and triangular, its spur short and dark, L.R. 2·6, tarsi not bearded. *Wings* unmarked and pale, halteres brownish. *Abdomen* black ; hypopygium (Text-fig. 3, *e*) with oval styles, narrow anal point and three appendages, the lower pair corresponding to the coxite extensions of *fuscipenne* but better formed.

Female not known.

Holotype male lost, type locality FRENCH CAMEROONS : Kribi.

DISTRIBUTION. The only specimen known to me is from BELGIAN CONGO : 1 ♂, Albertville, viii.1953 (*J. Verbeke*).

Polypedilum (Polypedilum) lobiferum Freeman

Polypedilum lobiferum Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 22.
Chironomus sp. de Meillon, 1937, *S. Afr. med. Journ.* **1937** : 658–660.

Blackish with some grey dusting, frontal tubercles present, palpi short, A.R. about 3, wings plain, male front tarsi with long beard, L.R. 1·1, anal point stout and hairy. Shows some structural resemblance to *fuscipenne* but easily separated by the more general dark colour, the lower L.R. and in the male by the bearded front tarsi and stout anal point.

Male. Wing length 3·5 mm.

Head, mouthparts and antennae dark, pedicel black, A.R. about 3, well developed frontal tubercles present, more or less raised on conical lobes, palpi short. *Thorax* completely black and dull, covered with grey pruinosity; acrostichal bristles small and poorly developed, dorso-centrals longer and irregularly biserial, all bristles pale. *Legs* brown, knees slightly darker, L.R. 1·1, scale white and with a short black spur, anterior tarsus with long beard. *Wings* milky, without dark markings, halteres brown. *Abdomen* blackish brown, more shining than thorax; hypopygium (Text-fig. 3, *f*) with stout hairy anal point, appendage 1 narrow, down-curved at apex, appendage 2 without long apical hair, styles blunt.

Female similar to male.

Holotype male in the British Museum, type locality CAPE PROVINCE: Bergvliet.

DISTRIBUTION. Known only from CAPE PROVINCE: type series from Bergvliet and Mossel Bay; 3 ♂, 3 ♀, Port Elizabeth, viii.1934 and further series vi.1957 (*B. de Meillon*). De Meillon (1937) reported that this species bred in enormous numbers in an artificial lake at Port Elizabeth and caused considerable nuisance in the town. He achieved control by raising the salinity.

Polypedilum (Polypedilum) longinervis Kieffer

Microtendipes longinervis Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 10.
Microtendipes tenuimanus Kieffer, 1922, *ibid.* **91**: 11 (SYN. NOV.).
Microtendipes pallidinervis Kieffer, 1922, *ibid.* **91**: 15 (SYN. NOV.).

Thorax reddish yellow, with a darker lateral stripe on the pleuron, abdomen dark brown, wings and legs unmarked, cross-vein unusually long, appendage 1 of male hypopygium bilobed. This is another species resembling *fuscipenne* but it is readily distinguished by the absence of frontal tubercles, by the plain legs and by the male hypopygium.

Male. Wing length 2–3 mm.

Head and mouthparts yellowish brown, antennae with dark plumes, A.R. 2·75, eyes well separated, frontal tubercles absent. *Thorax* reddish yellow, shoulders whiter, pleura with a horizontal dark stripe, postnotum brown, dorso-central bristles pale and uniserial. *Legs* yellow, apices of anterior femur and tibia vaguely darkened, scale triangular and with short spur, L.R. 2·5, anterior tibia hardly more than two-thirds length of femur, tarsus not bearded. *Wings* plain, cross-vein unusually long, more or less horizontal, halteres blackish. *Abdomen* dark brown; hypopygium (Text-fig. 3, *g*) with conical IXth tergite carrying a short, narrow anal point, styles stout, appendage 1 bilobed, appendage 2 short and with a longer hair at the apex.

Female resembles male, though thoracic stripes are partially darkened in some specimens.

All the type material is lost, all three were described from FRENCH CAMEROONS: Kribi. It is not clear from the original description whether the female described by Kieffer as *longinervis* really belongs to this species or not; it is however, quite certain that the male described as *longinervis* and the female as *tenuimanus* are the opposite sexes of the same species, whilst the male placed in *pallidinervis* also appears to be the same.

DISTRIBUTION. BELGIAN CONGO: 2 ♂, 1 ♀, Eala, iv–v. 1936 (*J. Ghesquière*); 1 ♂, Equateur, Flandria (*R. P. Hulstaert*); 4 ♂, 9 ♀, Elisabethville, xii. 1938–iv. 1939 (*H. J. Brédo*). The type locality is additional.

Polypedilum (Polypedilum) subconfluens Kieffer

Microtendipes subconfluens Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 9.

This species was described by Kieffer from a single female which is now lost; I have a second female which has tarsi and wings broken and for this reason I am not absolutely certain of the genus. However, it bears a resemblance to *fuscipenne* and so I am placing it here until more material of both sexes becomes available; it certainly does not belong to *Microtendipes* as now defined. Thorax yellow, with black markings anteriorly and around the wing bases; eyes almost touching on the vertex; anterior tibia black, scale with a sharp spur.

Female. Length 3–4 mm.

Head dark brown, palpi yellow and rather long, antennae with 6 segments, apical segment two and half times as long as fifth; eyes large, the narrow upper portions wider than usual and almost meeting on the vertex. *Thorax* mainly yellowish and shining but with blackish markings anteriorly, around wing bases including part of lateral stripes and on postnotum; dorso-central bristles short, pale and uniserial. *Legs* yellow, anterior tibiae completely and anterior femora partially black, scale triangular and with sharp spur, anterior tibia hardly three-quarters length of femur which appears rather long; combs of other legs partially fused, spur short. *Wings* plain, unmarked; halteres yellow. *Abdomen* dark brown, yellowish on segments 1 and 7–9 in the single specimen available to me.

Holotype female lost, locality not given in the original description.

DISTRIBUTION. NIGERIA: 1 ♀, Abuja, xii. 1954 (*R. W. Crosskey*).

Polypedilum (Polypedilum) bifalcatum Kieffer

Polypedilum bifalcatum Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 99; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 26.

Thorax brown or pale brown with variable darker markings, abdomen blackish or dark brown. Very similar to a number of other plain-winged species and only to be recognized with certainty by the structure of the male hypopygium, especially by the bent and tapered appendage 1.

Male. Wing length 1·5 mm.

Head and mouthparts brown, pedicel often paler, antennae brown, A.R. about 1·6. *Thorax* brown, often pale brown and with darker markings along the hair lines and on the pleura, dorso-central bristles uniserial. *Legs* brownish, anterior pair darker, L.R. about 1·8, scale oval and with a short spur. *Wings* unmarked, halteres yellow. *Abdomen* dark brown or blackish; hypopygium (Text-fig. 4, *a*) with appendage 1 strongly developed, bent and tapered near the middle to a narrow apex which is directed transversely, styles rather wide.

Female similar to male in colour.

Holotype male lost, type locality SUDAN : Shambe.

DISTRIBUTION. SUDAN : long series of both sexes at light, Yirol, vi–vii and xii.1954 (*E. T. M. Reid*). NIGERIA : 2 ♂, Kankiya, vii–x.1956 (*B. McMillan*). BELGIAN CONGO : long series of both sexes at light, Elisabethville, iv.1939 and Maka Lualaba, i.1939 (*H. J. Brédo*).

Polypedilum (Polypedilum) laterale Goetghebuer

Polypedilum laterale Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 487.
? *Kribiophilus calcaratus* Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 44.

Mesothorax yellowish, prescutellar area or part of it and a horizontal pleural stripe blackish, abdomen black, legs yellow, L.R. 2·5–3·0, wings unmarked, appendage 1 of male hypopygium curved and pointed. Separated from other plain-winged species by the hypopygial structure and the thorax colour. From the description and figure it seems likely that *K. calcaratus* is an earlier description of this species ; it certainly belongs to *Polypedilum* because the VIIIth tergite of the male is narrow basally ; the colour is rather darker, but more material may show that it is variable in this respect.

Male. Wing length 1·6–1·8 mm.

Head yellow, mouthparts brown, antennae dark, A.R. about 1·8, dorsal narrow portion of the eyes rather narrower than is usual. *Thorax* mainly yellowish ; pleura with a broad horizontal black stripe, postnotum and scutellum partially black ; further black markings present in prescutellar area either as a central triangular mark extending forwards as a line along line of acrostichal bristles, or as a more vague area which may be extended along lines of dorso-central bristles. *Legs* yellow and unmarked, though the anterior knees and tibiae may sometimes be darker ; anterior tibia short, hardly more than half length of femur, L.R. 2·5–3·0, scale narrow and pointed. *Wings* unmarked, halteres with black knobs. *Abdomen* blackish ; hypopygium (Text-fig. 4, *b*) with anal point at apex of conical extension of IXth tergite, appendage 1 curved and pointed, appendage 2 somewhat reduced, styles blunt.

Female resembles male.

I have seen the holotype male of *laterale* in Musée Royal du Congo Belge, Tervuren ; the type of *calcaratus* is lost (type locality FRENCH CAMEROONS : Kribi).

DISTRIBUTION. SUDAN : 1 ♀, Amadi and 1 ♀, Yirol, vi–vii.1953 (*E. T. M. Reid*). FRENCH WEST AFRICA, Haute Volta : 1 ♂, 2 ♀, nr. Bobo Dioulasso, ix.1956 (*J. Hamon*). BELGIAN CONGO : holotype male and two other males, Chambi, escarp. Kabasha ; 1 ♂, Ituri, Kasenyi, ii.1953 (*J. Verbeke*). N. RHODESIA : 1 ♂, Lower Luangwa River, ix.1910 (*S. A. Neave*). NATAL : 1 ♂, Tugela River, Drakensburg, ix.1953 (*A. D. Harrison*).

Polypedilum (Polypedilum) ephippium sp. n.

Thorax dark brown, wings plain, segments 1–5 of abdomen yellow, segment 3 with a black mark ; male appendage 1 stout basally and bent ; easily distinguished from *bifalcatum* and others with bent appendage 1 by the abdominal pattern.

Male. Wing length 2 mm.

Head and mouthparts brownish yellow, antennae pale, A.R. 1·75. *Thorax* dark brown and slightly pruinose, scutellum paler. *Legs* yellow and unmarked, anterior tibia three-quarters length of femur, scale oval and with a short spur at apex, anterior tarsi all broken, spur of posterior tibia long and slender. *Wings* unmarked, halteres yellow. *Abdomen* with segments 1–5 whitish yellow, segment 3 with a central saddle-shaped black mark, occasionally incisures are darker, segments 6–8 black, styles pale. Hypopygium (Text-fig. 4, *c*) variable ; in the holotype from which figure is drawn, appendage 1 stout and bent near the middle, tapering to a narrow apex ; in other specimens the narrow portion commences at the bend and

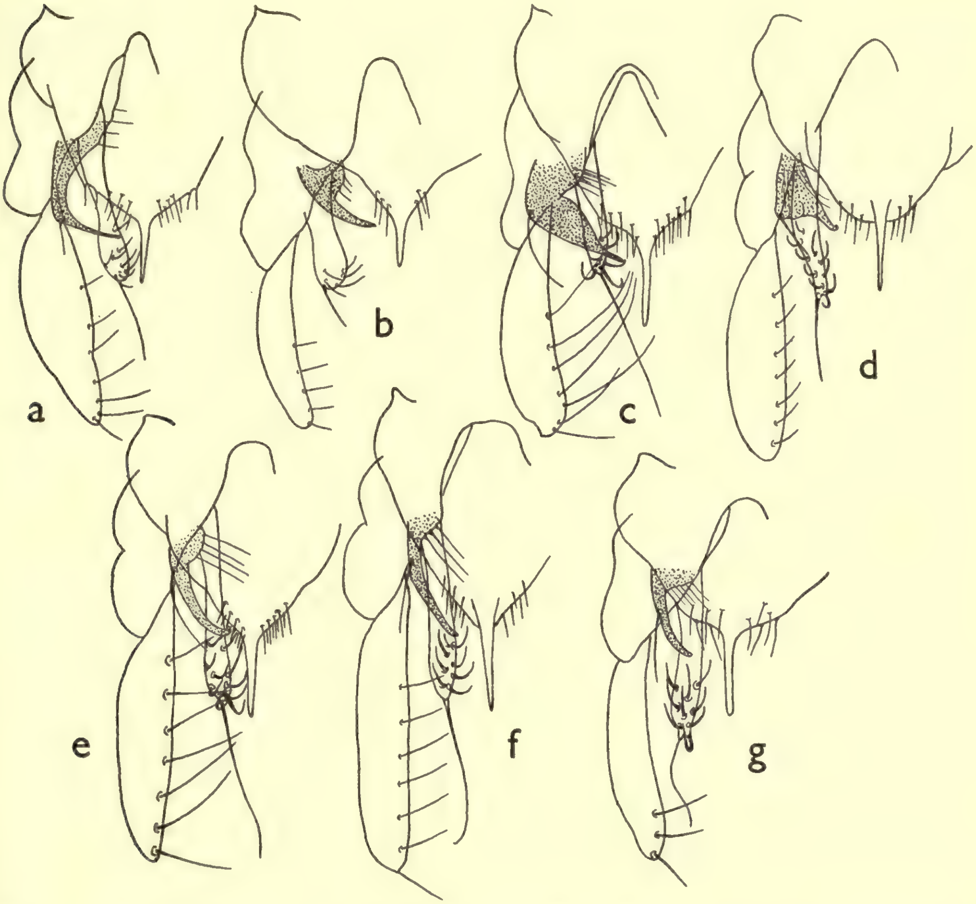

FIG. 4. Male hypopygia of *Polypedilum (Polypedilum)*. *(a) P. bifalcatum ; (b) P. laterale ; (c) P. ephippium ; (d) P. annulatum ; (e) P. brunneicornis ; (f) P. bipustulatum ; (g) P. melanophilus.*

in still others the whole appendage is shorter; appendage 2 narrow, apical hair long, styles with long inner hairs.

Female not known.

Holotype male and paratype 1 ♀, S. RHODESIA: Salisbury, ii–iii. 1956 (*E. T. M. Reid*); further paratypes, same locality and collector, 1 ♂, ix–x. 1954 and 3 ♂, iv. 1956. BELGIAN CONGO: 1 ♂, Elisabethville, ii. 1939 (*H. J. Brédo*). Sudan: 1 ♂, Mvolo, vi–vii. 1954 (*E. T. M. Reid*). All specimens in the British Museum except for the Elisabethville one which has been returned to Institut Royal des Sciences Naturelles, Bruxelles.

Polypedilum (Polypedilum) kibatiense Goetghebuer

Polypedilum kibatiense Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 487.
Polypedilum stilatum Freeman, 1955, *Explor. Parc nat. Albert* Miss. de Witte, **83**: 29 (SYN. NOV.).

Wings unmarked, body colour usually pale, sometimes with darker markings on thorax, halteres and at apices of abdominal segments. Most easily distinguished from other species except *annulatum* by the broader appendage 1 of the male hypopygium with its narrow beak; separated from *annulatum* by the absence of pale bands at the apices of the abdominal segments. Examination of the type of *kibatiense* has shown that *stilatum* is a synonym. The Palaearctic species *convictus* Walker is extremely similar and *kibatiense* may eventually prove only to be a form of this.

Male. Wing length 1·6–2·0 mm.

Head, mouthparts and antennae yellowish or yellowish brown, A.R. about 1·5. *Thorax* may be pale yellowish with stripes hardly darker and shoulders whitish or it may be of a browner tinge; postnotum and a horizontal pleural stripe often blackish or dark brown, but both may be pale in the palest specimens. *Legs* yellow or brownish, unmarked; L.R. 1·8, scale oval, spur scarcely distinguishable. *Wings* quite unmarked, halteres normally dark, but specimens with the knobs pale do occur. *Abdomen* usually plain greenish or yellowish, but in some specimens there are narrow dark rings at the apices of the segments. Hypopygium not distinguishable from that of *annulatum* (Text-fig. 4, *d*), appendage 1 broad and with an inner beak of variable shape.

Female not always recognizable with certainty as it is very similar to females of other pale species; where associated females are available they are very similar to the male.

I have seen the holotype male of *kibatiense* in Musée Royal du Congo Belge, Tervuren, type locality BELGIAN CONGO: N. Kivu. The holotype of *stilatum* is in the collections of the Institut des Parcs nationaux du Congo Belge, type locality BELGIAN CONGO: Rutshuru.

DISTRIBUTION. SUDAN: 1 ♂, 1 ♀, Yirol, xii. 1954 (*E. T. M. Reid*). UGANDA: 1 ♂, L. Victoria (*W. W. Macdonald*). BELGIAN CONGO: 8 ♂, 20 ♀, Maka Lualaba, i. 1939 (*H. J. Brédo*); 1 ♂, Elisabethville, iii. 1939 (*H. J. Brédo*). S. RHODESIA: 2 ♂, Mt. Chironda (*C. F. M. Swynnerton*); 1 ♂, Salisbury, iv. 1956 (*E. T. M. Reid*). NATAL: 1 ♂, Mooi River, Kamberg Game Reserve, ix. 1953 (*A. D. Harrison*).

Polypedilum (Polypedilum) annulatum Freeman

Polypedilum annulatum Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 22.

This species is only doubtfully distinct from *kibatiense*. The main point of difference lies in the colour, which is considerably darker, most specimens being dark brown, but it is quite usual for the thorax to be paler than the abdomen. The abdomen is ringed, each segment having a pale or pruinose apical band occupying about one-third of the segment. The halteres are always pale, but the thorax may have an indication of a darker pleural stripe. Male hypopygium (Text-fig. 4, *d* drawn from holotype) of same form as *kibatiense*, but quite variable and appendage 1 may be much broader with the " beak " placed centrally. It is not possible to define the species on the exact shape of appendage 1 because so many variations exist, although in all of them the base is broad and the apex beak-like.

Holotype male in the British Museum, type locality CAPE PROVINCE : Kirstenbosch.

DISTRIBUTION. SUDAN : 12 ♂, 4 ♀, Yirol, xii.1954 (*E. T. M. Reid*) ; 1 ♂, 1 ♀, Amadi, vi–vii.1954 (*E. T. M. Reid*). NIGERIA : 2 ♂, Kankiya, ix–x.1956 (*B. McMillan*). SÉNÉGAL : 1 ♂, nr. Dakar, ii.1954 (*J. Hamon*). BELGIAN CONGO : 11 ♂, 1 ♀, Elisabethville, xii.1938 (*H. J. Brédo*). CAPE PROVINCE : 1 ♂, 1 ♀, Wellington, xi.1955 (*K. M. F. Scott*) ; 1 ♂, Berg River, xii.1952 (*K. M. F. Scott*).

Polypedilum (Polypedilum) brunneicornis Kieffer

Chironomus brunneicornis Kieffer, 1911, *Trans. Linn. Soc. Lond.* (*Zool.*) **14** : 352.
Chironomus pandani Kieffer, 1911, *ibid.* **14** : 356 (SYN. NOV.).

A small yellowish brown species without conspicuous markings on body or wings ; A.R. 1·6, L.R. 2 or nearly so, halteres dark, posterior tibial spur long and straight, male hypopygium of simple type, appendage 1 narrow and curved. It is not easy to distinguish this species from other similar ones, but the antennal and hypopygial proportions differ from those of *melanophilus* whilst *dewulfi* and *vanderplankei* are darker and have pale halteres. From examination of the type series it appears that Kieffer described the female under the name *brunneicornis* and the male as *pandani*.

Male. Wing length 1·8 mm.

Head, mouthparts and antennae yellowish, A.R. 1·6. *Thorax* with whitish yellow background ; stripes, sternopleuron and postnotum reddish or brownish yellow. *Legs* uniformly yellowish, L.R. 2 or nearly so, scale more or less triangular and with very small spur, spurs of posterior legs rather long and straight. *Wings* unmarked, halteres with dark knobs. *Abdomen* yellowish green, unmarked ; hypopygium (Text-fig. 4, *e*) simple ; anal point well formed, appendage 1 narrow and curved, appendage 2 with long apical bristle, style of medium width, inner bristles long.

Female similar to male in colour.

C. brunneicornis was described from four female cotypes from SEYCHELLES : Mahé, two of which are in the British Museum ; I have labelled one of these lectotype. Kieffer described *pandani* from eight males from the same locality, four are in the British Museum and I have again labelled one as lectotype. No other specimens are known.

Polypedilum (Polypedilum) melanophilus Kieffer

Chironomus melanophilus Kieffer, 1911, *Trans. Linn. Soc. Lond.* (*Zool.*) **14** : 355.
Chironomus limnocharis Kieffer, 1911, *ibid.* **14** : 357 (SYN. NOV.).
Chironomus nocticolor Kieffer, 1911, , *ibid.* **14** : 357 (SYN. NOV.).
Polypedilum brunneum Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 178 (SYN. NOV.).

Superficially this species resembles *brunneicornis* but it differs as follows: size smaller (wing length 1·5 mm.), colour darker, being brown rather than yellow, A.R. only 0·5, styles of male hypopygium narrow (Text-fig. 4, *g*) and with a much less complete row of hairs, appendage 1 smaller, apical hair of appendage 2 shorter. It is quite possible that this is only a smaller form of *brunneicornis* but it is preferable to keep them separate until there is more information on the limits of the species in the genus.

C. melanophilus was described from a single female from SEYCHELLES: Mahé, in the British Museum. There are four cotypes males of *limnocharis*, two being in the British Museum, one of which I have marked as lectotype, type locality SEYCHELLES: Mahé. *C. nocticolor* was described from two female lectotypes from the same locality, both are in the Cambridge University Museum and I have marked one as lectotype. There is no real difference, other than sex, between any of these three species and they seem to be indistinguishable from material which I described as *brunneum* (type locality CAPE PROVINCE: Hermanus Waterfall)—type series in the British Museum. I have seen no other material which I can definitely associate with this species.

Polypedilum (Polypedilum) glabripennis Kieffer

Tanytarsus glabripennis Kieffer, 1911, *Trans. Linn. Soc. Lond.* (*Zool.*) **14** : 359.

It is not clear why Kieffer placed this tiny species in *Tanytarsus* as he states that the wings are bare, that the cross-vein is oblique and that there are only two hypopygial appendages. The species was described from both sexes but only a single female remains which I now fix as lectotype. It seems to belong to *Polypedilum*, although the pulvilli are not very large and is probably close to *melanophilus*. It is small and yellow and has R_{4+5} curved and rather widely separated from R_1. The following description is based on the original supplemented from the lectotype.

Wing length of female 1·0 mm.

Yellowish in colour, thoracic markings reddish. Male antennae said to be 12-segmented, A.R. not known, of female 6-segmented. Legs yellow, L.R. 2, posterior tibial combs with a single strong spur, combs separate, no tarsal beard. Wings bare, R_{4+5} with well-developed hairs, curved and unusually widely separated from R_1; R_{2+3} ending practically in contact with R_1, posterior fork distal to cross-vein which is oblique, squama with at least a partial fringe; halteres dark. Judging from the figure, male hypopygium very similar to that of *melanophilus*.

Lectotype female in the British Museum; type locality SEYCHELLES: Mahé. No other specimens are known.

Polypedilum (Polypedilum) dewulfi Goetghebuer

Polypedilum dewulfi Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 484.
Polypedilum scotti Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 21 ; Freeman, 1955, *Explor. Parc nat. Albert*, Miss. de Witte, **83** : 26 (SYN. NOV.).

This species is very similar indeed to *brunneicornis* and has identical hypopygial structure (Text-fig. 4, *e*), except that in some specimens—described as *scotti*—the styles are rather wider. In size it tends to be larger, wing length as much as 2·3 mm., and the colour is browner, but the halteres are pale ; in most specimens the posterior tibial spur is shorter and not as conspicuous as in *brunneicornis*. Further material from Seychelles may show whether the two species are really to be considered distinct.

I have seen the male holotype of *dewulfi* in Musée Royal du Congo Belge, Tervuren (type locality BELGIAN CONGO : Rutshuru) and find that *scotti* cannot be maintained as a distinct species. The holotype of the latter is in the British Museum (locality CAPE PROVINCE : Wellington).

DISTRIBUTION. SUDAN : 5 ♂, Khartoum, x.1951 (*D. J. Lewis*) ; 2 ♂, Shambe, xi.1953 (*E. T. M. Reid*). NIGERIA : 2 ♂, Kankiya, x.1956 (*B. McMillan*). BELGIAN CONGO : long series from Parc National Albert ; 3 ♂, Eala, ix.1936 (*J. Ghesquière*) ; 7 ♂, Elisabethville, xii.1938–iii.1939 (*H. J. Brédo*). NATAL : 3 ♂, 6 ♀, Weenen, iii.1924 (*H. P. Thomasset*) ; 5 ♂, Natal National Park, v.1954 (*W. D. Oliff*). CAPE PROVINCE : long series from Berg River (*K. M. F. Scott*).

Polypedilum (Polypedilum) vanderplanki Hinton

Polypedilum vanderplanki Hinton, 1951, *Proc. Zool. Soc. Lond.* **121** : 378.

In general structure this species is indistinguishable from *brunneicornis* and *dewulfi*, the male hypopygium is also identical. However, the colour is a much darker brown on both thorax and abdomen, whilst the legs are whitish yellow ; the halteres are pale. In addition the front tibial scale carries a long black spur as long as the scale itself. The female is very similar to the cotype females of *Paratendipes tavetanus* which I have seen in the Muséum National d'Histoire Naturelle, Paris (see at head of subgenus), but with the difficulties of comparing and distinguishing female specimens, especially when one lot is in spirit, I prefer not to synonymize them at this stage.

Holotype male in the British Museum (locality NIGERIA : Anara, 20 miles SE. of Kadua).

The type series were bred from larvae found in mud in holes in rock and have been shown by Hinton to be capable of withstanding drying for 18 months, they can be alternately dried and re-activated in water a number of times and they can tolerate temperatures of 41° C. No other specimens which can reliably be identified as belonging to this species are known to me.

Polypedilum (Polypedilum) bipustulatum sp. n.

Colour uniformly yellowish except for two dark rounded spots, one on each side of the middle of the mesonotum at the anterior ends of the lateral stripes ; halteres and often postnotum also, dark ; male styles long and of even width, appendage 1 narrow. Very similar to *dewulfi* but the colour pattern seems sufficient to separate it.

Male. Wing length 1·8–2·6 mm.

Head and mouthparts yellow, antennae may be more brownish, A.R. about 1·8. *Thorax* yellowish or reddish yellow, anterior ends of lateral stripes dark brown or blackish, together forming a pair of dark rounded spots near the middle of the mesonotum, postnotum also darker in many specimens but not always as dark as the spots. *Legs* yellow, L.R. 1·5, scale triangular and sharp at the apex. *Wings* unmarked, halteres with black knobs. *Abdomen* yellow or greenish and without darker markings; hypopygium (Text-fig. 4, *f*) very similar to *dewulfi* but appendage 1 very narrow and styles appear longer and of more uniform width.

Female similar to male in pattern, but thoracic stripes may be brownish.

Holotype male SUDAN : Amadi, vi–vii.1954 (*E. T. M. Reid*). Paratypes : SUDAN : 1 ♂, 2 ♀, Adok, Shambe and Melut, xi.1953 (*E. T. M. Reid*) ; 1 ♂, Juba, vi–vii.1954 (*E. T. M. Reid*). NIGERIA : 2 ♀, Abuja, xii.1954 (*R. W. Crosskey*) ; 1 ♂, Zaria, vii–ix.1956 (*B. McMillan*) ; 1 ♂, Ilorin, vii.1912 (*J. W. S. Macfie*) ; 1 ♀, Onitsha (*T. J. Anderson*). BELGIAN CONGO : 12 ♂, 6 ♀, Maka Lualaba, i.1939 (*H. J. Brédo*) ; 1 ♂, Musosa, xi.1939 (*H. J. Brédo*) ; 6 ♂, 3 ♀, Elisabethville (*H. J. Brédo*) ; 2 ♂, Eala (*J. Ghesquière*). Holotype and 18 paratypes in the British Museum, remainder of series returned to Institut Royal des Sciences Naturelles de Belgique.

Polypedilum Kieffer Subgenus **Pentapedilum** Kieffer

Pentapedilum Kieffer, 1913, *Bull. Soc. Hist. nat. Metz,* **28** : 25 ; Kieffer, 1923, *Ann. Soc. ent. France,* **92** : 166 ; Goetghebuer, 1938, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*) : 77 ; Freeman, 1954, *Proc. R. ent. Soc. Lond* (B) **23** : 22 ; Freeman, 1955, *Explor. Parc Nat. Albert,* Miss. de Witte, **83** : 30.

Tanytarsus Kieffer, 1913, *Voy. All. Jean. Afr. Or. Ins. Dipt.* **1** : 24 (in part).

Rosenia Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 275 ; Kieffer, 1921, *Ann. Soc. ent. France,* **90** : 34 ; Kieffer, 1923, *ibid.* **92** : 167 (SYN. NOV.).

? *Kribiopelma* Kieffer, 1921, *ibid.* **90** : 34 ; Kieffer, 1923, *ibid.* **92** : 168.

Pentapedilum subg. *Pentapedilum* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 376.

Chironomus subg. *Pentapedilum* Edwards, 1931, *Dipt. Pat. S. Chile,* **2** : 310.

Polypedilum subg. *Pentapedilum* Townes, 1945, *Amer. midl. Nat.* **34** : 61.

This subgenus differs from the typical subgenus only by the presence of macrotrichia on the wing membrane, at least at the apex. I have seen specimens of eight species which I am able to key and describe. In addition Kieffer has described three other species with hair on the wing membrane, two certainly and one doubtfully falling into this subgenus and on which I am giving the following notes.

Pentapedilum kribiense Kieffer, 1923, *Ann. Soc. ent. France,* **92** : 166. Described from a yellowish female 1·8 mm. long from French Cameroons : Kribi, type probably lost. It is not possible to identify this from the description beyond the genus.

Rosenia pallida Kieffer, 1923, *Ibid.* **92** : 167. Genus monotypic ; described from a whitish male from Kribi, 1·5 mm. long. He mentions that the cross-vein is oblique, anterior tibia spurred, segment 8 narrow basally and hypopygium with two appendages. This causes *Rosenia* to fall as a synonym of *Pentapedilum*. The species is impossible to identify with certainty but it may be an earlier description of *micra* sp. n.

Kribiopelma albida Kieffer, 1923, *ibid.* **92** : 168. Genus monotypic ; described from a whitish female, length 1·5 mm. from Kribi. It is impossible to do more than query this as a species of *Pentapedilum*. It is unlikely to be *Tanytarsus* because the cross-vein is oblique, but genera and species of these groups based on females alone which are now lost are virtually impossible to determine satisfactorily.

KEY TO AFRICAN SPECIES OF *Polypedilum* SUBGENUS *Pentapedilum*

(Based on male characters)

1. Macrotrichia of wing membrane confined to apices of cells R_{4+5} and M_{1+2}, none in posterior fork cell 2
   Macrotrichia more numerous, present at least at apex of fork cell . . . 3
2. Anal lobe of wing absent (Text-fig. 5, *a*), halteres black . . . *ruandae* Freeman
   Anal lobe well developed (Text-fig. 5, *b*), halteres yellow . . . *calvescens* sp. n.
3. Abdomen with broad dark bands at bases of segments . . . *vittatum* sp. n.
   If bands are present then they are narrow and apical 4
4. A very small species, wing length 0·8–1·0 mm., wings cuneiform (Text-fig. 5, *d*), anal point simple . . . . *micra* sp. n.
   Wing length at least 1·75 mm., wings not cuneiform or else anal point with lateral teeth causing it to appear trifid 5
5. Anal point of male trifid, not unlike *Polypedilum* (*Polypedilum*) *tridens* (Text-fig. 2, *g*) *kijabensis* nom. nov.
   Anal point without lateral teeth 6
6. Macrotrichia reduced, only present at apex and with 3–5 in fork cell . *hamoni* sp. n.
   Macrotrichia present over most of surface, numerous in fork cell 7
7. Anal point narrow, as in *calvescens* (Text-fig. 5, *e*), appendage 1 normal. *wittei* Freeman
   Anal point very broad, appendage 1 reduced (Text-fig. 5, *f*) . . *anale* Freeman

Polypedilum (Pentapedilum) ruandae Freeman

Pentapedilum ruandae Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, **83** : 30.

Dark brown or blackish, abdomen plain ; male distinguished from other African species by reduction of macrotrichia on wing membrane, present only on apical half, none present in fork cell ; female with macrotrichia in all cells, but sparsely and only as a single line in base of basal cell, it is darker than *wittei*.

Male. Wing length 2·75 mm.

Head, mouthparts and palpi dark brown or blackish, A.R. about 1·75. *Thorax* dark brown or blackish with some pruinosity, scutellum may be pale. *Legs* uniformly dark brown, anterior tibial scale triangular, spur well formed, L.R. about 1·4. *Wings* unmarked, macrotrichia present only on apical half, confined to cell R_5 and apex of cell M_2, absent from fork cell and anal cell ; anal region reduced so that wing narrows evenly to the base (Text-fig. 5, *a*). Halteres black. *Abdomen* black with some pruinosity ; hypopygium of a simple type similar to that of *calvescens* (Text-fig. 5, *e*).

Female differs from male in the broader wings with denser macrotrichia which are to be found over most of the wing surface posterior to the radius, but only as a single line in the basal half of the basal cell ; macrotrichia not as dense as in *anale*.

Holotype male in collection of Institut Royal des Parcs nationaux du Congo Belge.

DISTRIBUTION. BELGIAN CONGO : type series of 282 ♂, 68 ♀, Ruanda, L. Ngando, 8,000 ft., iii.1935. CAPE PROVINCE : 1 ♂, 2 ♀, Vlei, Cecilia's Drift, ix.1955 (*K. M. F. Scott*).

Polypedilum (Pentapedilum) calvescens sp. n.

This species is very similar to a small *ruandae* in appearance and structure, wing length 2·0 mm., but it differs by having yellow legs and halteres, by the enlarged anal area of the male wing (Text-fig. 5, *b*) and by the reduction of the macrotrichia to a small patch at the extreme apices of cells R_5 and M_2 ; male hypopygium of simple type (Text-fig. 5, *e*). In the female, macrotrichia are present on the membrane of the apical half of cells R_5, M_2 and of the posterior fork cell and also around the margin of the apical half of the anal cell.

Holotype male and paratype 1 ♂, CAPE PROVINCE : Berg River, French Hoek, iii–iv.1955 (*K. M. F. Scott*), both in the British Museum.

Polypedilum (Pentapedilum) vittatum sp. n.

Yellowish brown or brown, thoracic markings darker brown, abdominal segments with broad dark bands basally ; wings with anal area moderately developed, macrotrichia more uniform than in *calvescens*, halteres black. Easily distinguished from other species in the male by the broad bands on the abdominal segments, female almost indistinguishable from *wittei*.

Male. Wing length 2–3 mm.

Head and antennae brown or yellowish brown, A.R. 1·7–2·0, palpi darker. *Thorax* brown or yellowish brown, stripes, postnotum and parts of pleura dark brown. *Legs* yellowish, L.R. 1·5, tibial scale rounded and with a small inconspicuous spine. *Wings* (Text-fig. 5, *c*) with anal lobe moderately developed, macrotrichia evenly but not densely distributed over most of wing, absent from bases of fork cell, anal and basal cells ; halteres with black knobs. *Abdomen* yellowish, segments 2–6 with basal halves or more brown ; hypopygium very similar to *calvescens* anal point perhaps narrower, appendage 2 with a few more hairs.

Female with rather denser macrotrichia, abdomen indistinctly banded, not easy to distinguish from *wittei*.

Holotype male and paratypes 10 ♂, 3 ♀, S. RHODESIA : Salisbury, iv–v.1956 (*E. T. M. Reid*). Further paratypes : UGANDA : 1 ♂, 1 ♀, Kilembe, Ruwenzori Range, xii.1934–i.1935 (*F. W. Edwards*) ; 1 ♂, Muko, Kigezi Province, xii.1934 (*E. G. Gibbins*). All specimens are in the British Museum.

Polypedilum (Pentapedilum) wittei Freeman

Pentapedilum wittei Freeman, 1955, *Explor. Parc Nat. Albert,* Miss. de Witte, **83** : 30.

A pale yellowish or reddish species, easily distinguished from others by the narrow dark bands at the apices of the abdominal segments and the narrow anal point. These bands were not mentioned in the original description, but closer inspection of the holotype, which is not a very good specimen, reveals their presence.

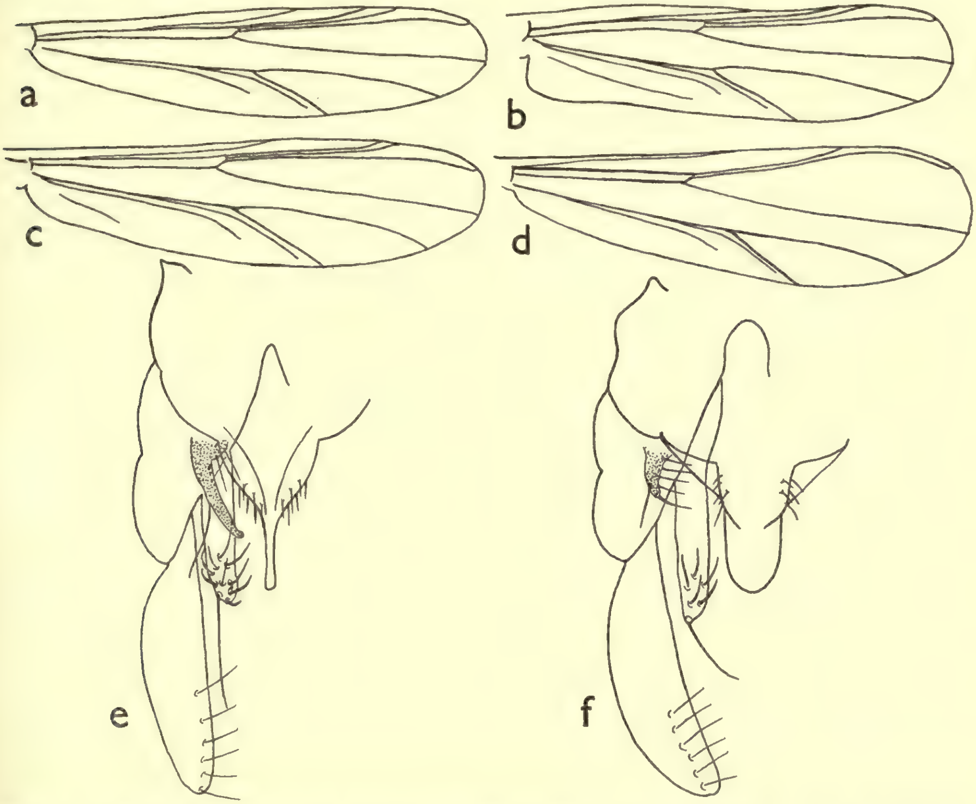

FIG. 5. Wings and hypopygia of males of *Polypedilum* (*Pentapedilum*). (*a*) *P. ruandae ;* (*b*) *P. calvescens ;* (*c*) *P. vittatum ;* (*d*) *P. micra ;* (*e*) *P. calvescens ;* (*f*) *P. anale.*

Male. Wing length 1·75–2·0 mm.

Head, mouthparts and antennae yellowish, A.R. 2·0. *Thorax* yellowish brown with darker brown markings on parts of the pleura and sometimes on the stripes as well. *Legs* yellowish, without markings, L.R. 2·0, tibial scale with well-formed spur. *Wings* plain, macrotrichia fairly evenly distributed over most of the wing surface, anal lobe moderate and similar to *vittatum* ; halteres black. *Abdomen* yellowish, segments 1–6 narrowly dark at apices or at the incisures ; hypopygium similar to *calvescens*, as in *vittatum* the anal point is possibly finer.

Female very similar to male, abdomen without markings, rather paler than in female of *vittatum*.

Holotype male in collection of Institut des Parcs nationaux du Congo Belge (type locality BELGIAN CONGO : Kivu, Kalondo).

DISTRIBUTION. FRENCH WEST AFRICA, Haute Volta : 8 ♂, Leri nr. Tougan, xi.1954 (*J. Hamon*). NIGERIA : 1 ♂, Katsina, x.1956 (*B. McMillan*). SUDAN : 11 ♀, Amadi, vi–vii.1954 and 5 ♂, 9 ♀, nr. Wau, iii.1955 (*E. T. M. Reid*). BELGIAN CONGO : 13 ♂, 22 ♀, Maka Lualaba, i.1939 and 9 ♂, 47 ♀, Elisabethville (*H. J. Brédo*), type locality additional. TRANSVAAL : 1 ♂, Kruger National Park, Pretoriuskop and 1 ♀, Olifants River, Loskop Dam, v.1955 (*A. D. Harrison*).

Polypedilum (Pentapedilum) hamoni sp. n.

Thorax with brown markings, postnotum blackish, halteres with black knobs, abdomen clear green ; macrotrichia confined to apex of wings ; hypopygium of simple type, anal angle of wing as in *wittei*. The main features distinguishing this species from *wittei* are the plain green abdomen and the greatly reduced macrotrichia, the former feature also distinguishes it from *ruandae*.

Male.—Wing length 2·5 mm.

Head, mouthparts and antennae brown, A.R. 2·5. *Thorax* yellowish, mesonotal stripes and sternopleuron brown, lateral stripes especially dark, postnotum blackish. *Legs* yellowish brown, unmarked, L.R. 2·3. *Wings* with anal angle as in *vittatum* and *wittei* ; macrotrichia present as a central band in apical half of cell R_{4+5}, as a patch at the extreme apex of cell M_2 and as a group of 3–5 at extreme apex of fork cell ; halteres with black knobs. *Abdomen* clear green, without dark markings ; male hypopygium of simple type, not unlike that of *calvescens* sp. n.

Females taken at the same time as the males have macrotrichia more evenly distributed over the apical half and around the anal margin ; colour very similar to males.

Holotype male and 13 ♂, 4 ♀ paratypes, BELGIAN CONGO : Bukavu, R. Mufuli, 2,400 metres, v.1957 (*J. Hamon*). Holotype in collection of Office de la Recherche scientifique Outre Mer, Bondy, France ; seven paratypes in British Museum.

Polypedilum (Pentapedilum) micra sp. n.

Distinguished from other African species by its very small size, pale colour and low antennal ratio ; wings cuneiform, R_{2+3} indistinguishable, wing membrane evenly covered with macrotrichia, abdomen plain.

Male. Wing length 0·8–1·0 mm.

Head, mouthparts and antennae yellow, A.R. hardly more than 0·6. *Thorax* yellowish, stripes brownish, pleura with horizontal dark band. *Legs* pale and unmarked, tibial scale sharply triangular, L.R. about 2. *Wings* unmarked, broad apically and more or less cuneiform with reduced anal area (Text-fig. 5, *d*), R_{4+5} close to R_1 and obliterating R_{2+3}, posterior fork more distal to cross-vein than in other species, macrotrichia evenly distributed ; halteres with black knobs. *Abdomen* plain yellowish ; hypopygium similar to *calvescens*.

Female similar to male.

Holotype male and paratypes 3 ♂, 3 ♀, SUDAN : Wunatong, nr. Wau, iii.1955 (*E. T. M. Reid*). Further paratypes, SUDAN : 1 ♂, Amadi, vi–vii.1954 (*E. T. M. Reid*). GOLD COAST : 4 ♂, 2 ♀, Kete Krachi, x.1898 (*Graf Zech*). FRENCH WEST AFRICA, Haute Volta : 1 ♂, Tangrela, nr. Banfora, xii.1956 (*J. Hamon*). Four paratypes returned to Museum der Universität, Berlin, one to Institut d'Enseignement et de Recherches Tropicales, Bondy, France, holotype and remainder of series in the British Museum.

Polypedilum (Pentapedilum) anale Freeman

Pentapedilum anale Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 22 ; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2** : 376.

Typical South African specimens are dark in colour with thorax almost black, but specimens from further north are paler and similar to *wittei* with darker bands at the abdominal incisures ; A.R. 1·3, wings with anal lobe reduced and evenly clothed with macrotrichia. Distinguished from all other African species by the broad anal point of the male.

Male. Wing length 1·75–2·0 mm.

Head, mouthparts and antennae black in southern specimens, paler in some northern specimens, A.R. 1·3. *Thorax* in southern specimens blackish and rather shining but it may be brown or paler with reddish stripes in other material. *Legs* brown or yellowish brown, L.R. 1·5–1·75, tibial scale with sharp spur. *Wings* with anal lobe moderately reduced, similar to *vittatum*, evenly clothed with macrotrichia, halteres black. *Abdomen* either very dark and with a greenish tinge or brown and slightly darkened at the incisures ; hypopygium (Text-fig. 5, *f*) with broad and down-turned anal point, appendage 1 reduced, with long hairs and formed into a narrow spine apically, appendage 2 with few hairs.

Female similar to male, wing macrotrichia rather denser, as usual in this sex.

Holotype male in the British Museum (type locality CAPE PROVINCE : Palmiet River, Elgin).

DISTRIBUTION. CAPE PROVINCE : type series from Elgin, Muizenberg Mt., Wellington, Bergvliet, Kirstenboch and French Hoek ; additional specimens from Cape Peninsular, Tzitzikama Forest and Assegaibos (*P. Brinck*). BASUTOLAND : Nazareth (*P. Brinck*). SW. AFRICA : Kaokoveldt (*P. Brinck*). TRANSVAAL : 4 ♂, 3 ♀, Olifantsvlei, nr. Johannesburg, viii.1954 and 4 ♂, 3 ♀, Klipspruit, nr. Witbank, iv–v.1956 (*A. D. Harrison*). S. RHODESIA : 5 ♂, 4 ♀, Salisbury, iv.1956 (*E. T. M. Reid*). BELGIAN CONGO : 1 ♂, Elisabethville, ii.1939 (*J. H. Brédo*). UGANDA : 1 ♂, 1 ♀, Kampala, xi.1929 (*G. L. R. Hancock*). FRENCH WEST AFRICA, Haute Volta : 1 ♂, nr. Bobo Dioulasso, xi.1956 (*J. Hamon*).

Mr. Harrison tells me that in the Transvaal this species is found in streams heavily polluted with industrial effluent containing sulphuric acid strong enough to taste.

Polypedilum (Pentapedilum) kijabensis nom. nov.

Tanytarsus alticola Kieffer, 1913, *Voy. All. Jean. Afr. Or. Ins. Dipt.* **1** : 25 (not *Polypedilum alticola* Kieffer, 1913, *ibid.* **1** : 22—see above).

I have seen the type male of this species and can confirm that it belongs to this genus and not to *Tanytarsus*, no other specimens are known. It is dark brown, 2·5 mm. long and can be separated from other species of the genus by the anal point of the male which resembles that of *Polypedilum* (*Polypedilum*) *tridens* in having a tooth each side near the base. The name *alticola* is preoccupied when the species is transferred to *Polypedilum*.

Holotype male in Muséum National d'Histoire Naturelle, Paris, type locality KENYA : Kijabe, Kikuyu Escarpment.

Genus ***STICTOCHIRONOMUS*** Kieffer

Stictochironomus Kieffer, 1919, *Ent. Mitteil.* **8** : 44 ; Freeman, 1955, *Explor. Parc Nat. Albert, Miss. de Witte*, **83** : 24

Kribiocallis Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 271 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 16 (SYN. NOV.).

Chironomus subg. *Stictochironomus* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 400.

Tanytarsus subg. *Stictochironomus* Townes, 1945, *Amer. midl. Nat.* **34** : 77.

Antennae of male with 14 segments, of female with 6 segments ; frontal tubercles absent. Pronotum rather more reduced than in *Polypedilum* but better developed than in *Microtendipes* ; mesonotum often with a small central tubercle or slight hump ; dorso-central bristles long and usually uniserial, acrostichals small but usually in a complete double row, occasionally completely absent, not reduced to an anterior group as in *Microtendipes*. Anterior tibia with an oval scale not armed with a spur ; combs of other tibiae fused and with a single spur on each pair ; pulvilli not split, usually rather small. Wing membrane without macrotrichia, with or without dark markings ; squama with complete fringe ; R_{2+3} distinct and ending well beyond tip of R_1, posterior fork either at same level as or beyond cross-vein. Eighth abdominal tergite of male not contracted basally, styles often rather narrow, appendage 1 curved, appendage 2 with or without long apical hair.

In general appearance, the species of this genus approach those of *Polypedilum* but they cannot be included in that genus because of the more reduced and unsplit pulvilli, the absence of a spur on the anterior tibial scale and by the square shape of the VIIIth tergite of the male. The genus is perhaps to be regarded as an intermediate stage between *Polypedilum* and *Microtendipes*.

Townes (1945) suggested an interesting alteration in relationships by placing this genus along with *Endochironomus* and *Tanytarsus* (= *Pentapedilum* subg. *Phaenopsectra* of Edwards, 1929) as subgenera of a single genus, which took the oldest name, *Tanytarsus*, following the type fixation of Coquillett, 1910 (see also below, under the genus *Tanytarsus*). Although this change in relationships may eventually prove correct, I am not sufficiently certain to adopt it and I prefer for the present to consider *Stictochironomus* as closer to *Polypedilum* and *Microtendipes* than to any other genera. I have not been able to find any forked bristles at the apex of the styles of the African species similar to those seen by Townes in the North American species.

Of the six species known to me from Africa south of the Sahara, *festivus* and *natalensis* are quite typical and have ringed legs and a central thoracic tubercle; *caffrarius*, *puripennis* and *fusiformis* resemble each other but are not very typical of the genus, whilst *bisignatus* in appearance is more like a species of *Microtendipes*. However, all show the main generic characters and it is convenient to consider them as all belonging to the one genus.

KEY TO THE AFRICAN SPECIES OF *Stictochironomus*

1 Femora and tibiae with dark bands or rings 2
Legs lacking dark bands although knees may be darkened 4
2. Wings with a dark cloud over cross-vein and no other markings . . *natalensis* sp. n.
Wings heavily marked with black spots 3
3. Large marking in cell R_5 including a clear spot (Pl. 2, fig. *a*) . *festivus festivus* Kieffer
No clear spot in this marking (Pl. 2, fig. *b*) . . . *festivus imperforatus* subs. n.
4. Wings with two broad tansverse dark marking (Pl. 2, fig. *e*); knees darkened *bisignatus* Kieffer
Wings either spotted or seamed, knees plain 5
5. Wings with pattern of spots (Pl. 2, fig. *c*); mesonotum with conspicuous silvery pruinosity on lateral stripes . . . . *caffrarius* Kieffer
Wings seamed with grey (Pl. 2, fig. *d*); mesonotal pruinosity not in form of two conspicuous stripes 6
6. Wing length 3–4 mm., thoracic pruinosity less strong and more in form of spots *puripennis* Kieffer
Wing length 1·5–2·0 mm., pruinosity stronger and more uniform . . *fusiformis* Kieffer

Stictochironomus festivus festivus Kieffer

Stictochironomus festivus Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 54.
Kribiocallis stictoptera Kieffer, 1922, *ibid.* **91** : 17 (SYN. NOV.).

Thorax black, mottled with pruinosity; legs white, heavily ringed with black; wings with distinctive black markings, in the typical subspecies the large spot in cell R_{4+5} includes a clear spot; abdomen of male greenish yellow on 4 basal segments. The colour and pattern make this species easily distinguishable from all other African ones and enable both of Kieffer's species to be readily recognized and easily synonymized.

Male. Wing length 2–2·5 mm.

Head, antennae and mouthparts black, plumes brown, A.R. about 2·5. *Thorax* black or very dark brown, conspicuously mottled with pruinose spots, central tubercle distinct. *Legs* white, strongly marked with black rings; anterior femur with basal and apical thirds black, central third white with a black ring, other femora with basal third and apical fifth black, central pale part including two dark rings; all tibiae with base and apex broadly black, intervening portion with two narrow black rings; anterior basitarsus with apex and two intermediate rings black, other basitarsi with apex and a single central ring black; second segment of anterior tarsus with a broad central band and broad apical band black, other segments of this and other legs with apices broadly black; L.R. 1·5, tarsi thinly bearded. *Wings* (Pl. 2, fig. *a* of female) with black markings similar to female, the large mark in cell R_{4+5} reaches to apex of R_1 and includes a pale spot; halteres pale. *Abdomen* with segments 1–4 yellowish green, remainder dark, styles pale, all segments pruinose on apical halves. Hypopygium (Text-fig. 6, *a*) with long anal point and narrow coxites, appendage 1 curved and with a long subapical hair, 2 with a long apical hair.

Female, resembles male, antennae rather short, abdomen less clear yellow on basal segments; one wing of a Gold Coast specimen has the clear spot in the main marking more or less occluded but the markings are not reduced as in the South African subspecies.

I have not seen the types which are probably lost; *festivus* was described from both sexes from SUDAN: Shambe, *stictoptera* from a female from FRENCH CAMEROONS: Kribi.

DISTRIBUTION. SUDAN: 2 ♂, 5 ♀, Khartoum, i.1923 (*S. Hirst*); 3 ♂, 1 ♀, Khartoum, ii.1952 (*D. J. Lewis*); 6 ♂, 3 ♀, Wad Medani, ii.1952 (*D. J. Lewis*); 1 ♀, Tonga, xi.1953 (*E. T. M. Reid*); 2 ♂, Liednum nr. Wau, ii–iv.1955 (*E. T. M. Reid*). GOLD COAST: 2 ♀, Nangodi, x.1954 (*G. Crisp*). TRANSVAAL: 1 ♂, Pongola Settlements, ix.1954 (*A. D. Harrison*).

Stictochironomus festivus imperforatus subsp. n.

This is extremely similar to the typical subspecies in colour and structure but differs in two points of pattern: first, the anterior basitarsus lacks the basal intermediate dark ring and sometimes also the more apical intermediate dark ring as well; secondly, the large spot in cell R_{4+5} does not include a pale spot (Pl. 2, fig. *b*), it and the one behind it in cell M_{1+2} are distinctly smaller than in the typical subspecies.

These differences seem to warrant at least subspecific separation, but further material from other localities may show either that it is only a local variety or else that a distinct species is present. It is possibly a colder water form, but the specimens from Nelspruit and Letsitele taken in conjunction with the specimen of the typical subspecies from the Pongola Settlements give an overlap about which more information is needed.

Holotype male, NATAL: Mooi River, Keate's Drift, ix.1953 (*A. D. Harrison*). Paratypes: NATAL: 1 ♂, same data as holotype; 1 ♀, Tugela R., Colenso, ix.1953 (*A. D. Harrison*); 1 ♂, Albert Falls, x.1953 and 2 ♀, Tugela R., x–xi.1953 (*W. D. Oliff*); 1 ♀, Mooi R., Keate's Drift, x.1954 (*W. D. Oliff*); 7 ♀, Weenen, iii.1924, 1 ♀, viii.1924, 2 ♀, x.1924 (*H. P. Thomasset*). TRANSVAAL: 1 ♂, Nelspruit, iii.1930 (*B. de Meillon*); 1 ♀, Letsitele Valley, iii.1932 (*B. de Meillon*). All specimens are in the British Museum.

Stictochironomus natalensis sp. n.

Thorax more or less mottled, legs with broad but not conspicuous rings, wings with a dark cloud over cross-vein, abdomen of male brown, each segment paler and pruinose at its apex. In general appearance not unlike the Palaearctic species *S. histrio* Fabricius, but it may be distinguished by the different arrangement of the leg bands especially the femoral ones.

Male. Wing length 4 mm.

Head, mouthparts and antennae brown, A.R. 2·4. *Thorax* dark brown, more or less mottled with pruinosity and pruinose between the stripes and around the shoulders; pruinosity not as conspicuous as in *festivus,* central tubercle present. *Legs* yellowish, each femur with three broad brown bands, one at the base, one near the middle and one at the apex; all tibiae with basal third and apex dark, middle and posterior tibiae with an additional broad brown band near the middle; all tarsal segments dark at apex, anterior basitarsus with faint central brown band; L.R. about 1·1, slight tarsal beard present. *Wings* unmarked except for a round grey cloud over cross-vein and adjacent veins. *Abdomen* brown, each segment paler towards the apex, especially laterally, apices of segments pruinose; hypopygium broken.

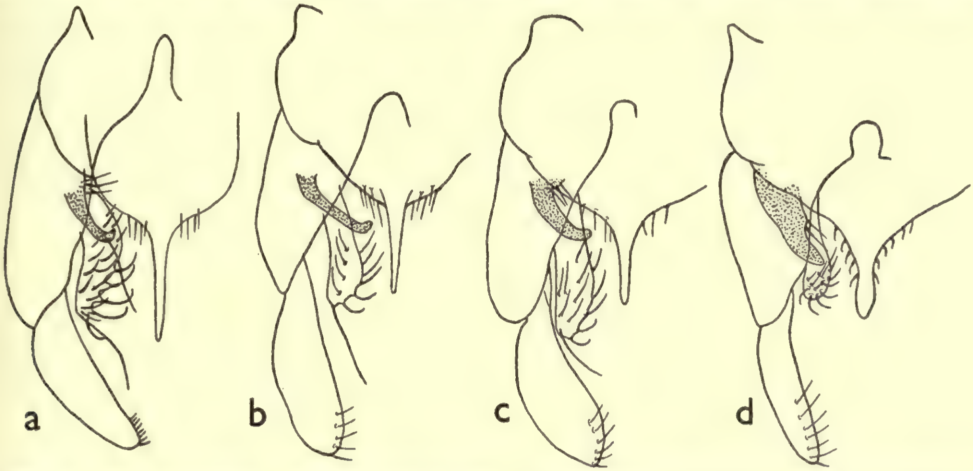

FIG. 6. Male hypopygia of *Stictochironomus.* *(a) S. festivus festivus; (b) S. caffrarius; (c) S. puripennis; (d) S. bisignatus.*

Female not known.

Holotype male, NATAL: Estcourt, ix–x.1896 (*G. A. K. Marshall*) in the British Museum.

Stictochironomus caffrarius Kieffer

Polypedilum caffrarium Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 97; Freeman, 1955, *Explor. Parc. Nat. Albert,* Miss. de Witte, **83** : 25; Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2** : 377.

Kribiocharis albipes Kieffer, 1922, *Ann. Soc. ent. France,* **91** : 4.

Polypedilum nilophilus Kieffer, 1922, *ibid.* **91** : 33 (SYN. NOV.).

Polypedilum pluriguttatum Kieffer, 1922, *ibid.* **91** : 34 (SYN. NOV.).

Polypedilum dampfi Kieffer, 1925, *Bull. Soc. R. ent. Égypte,* 1924 : 272 (SYN. NOV.).

Polypedilum anuke Kieffer, 1935, *ibid.* **1924** : 275 (SYN. NOV.).

This species is easily recognized by its unringed legs, dark thorax with distinctive pruinose lateral stripes and wings with three or four spots in cell R_{4+5}; there is no central thoracic tubercle and in some ways it is not a typical species of the genus, but it is not sufficiently atypical to warrant the erection of a new genus. I have seen the type of only *caffrarius* but the wing pattern makes the other species which I have placed in synonymy easily recognizable. It is a wide-spread species and is especially abundant along the Nile.

Male. Wing length 2–2·5 mm.

Head, antennae and mouthparts brown or dark brown, A.R. 2·75. *Thorax* dark brown or blackish, whole surface slightly pruinose but lateral stripes conspicuously so, especially if examined from behind when they stand out as two broad silvery bands. *Legs* yellowish white, femora usually darker or brown on basal two-thirds; L.R. 1·3, tarsi not bearded, pulvilli practically absent. *Wings* (Pl. 2 fig. *c* of female) with pattern of grey spots; cell R_{4+5} normally with three spots but the apical one may be divided to give four; spots at each angle of fork cell also characteristic; halteres yellowish white. *Abdomen* dark brown or blackish, sometimes paler laterally especially near the base; hypopygium (Text-fig. 6, *b*) with long anal point, appendage 1 bent near base and apex, appendage 2 with long apical hair, style rounded at tip.

Female similar to male in colour and pattern.

I have seen the cotypes of *caffrarium* in the South African Museum (type locality TRANSVAAL: Kaapmuiden); all the other type series are lost. Kieffer described *albipes* and *nilophilus* from SUDAN: Shambe; *pluriguttatum* from FRENCH CAMEROONS: Kribi; *dampfi* and *anuke* from EGYPT: Cairo and Maadi respectively.

DISTRIBUTION. EGYPT: 1 ♂, Suez Canal, x.1934 (*F. W. Edwards*). SUDAN: numerous specimens from Khartoum and Wad Medani (*S. Hirst* and *D. J. Lewis*). ABYSSINIA: 3 ♂, Sagan-Omo, Elolo, viii.1939 (*E. Zavattari*). NIGERIA: 12 ♂, Kankiya, x.1956–i.1957 (*B. McMillan*). BELGIAN CONGO: series from Vitshumbi, Kasenyi and Albertville (*de Witte* and *Verbeke*); 2 ♀, Musosa and 2 ♂, Maka Lualaba (*H. J. Brédo*). S. RHODESIA: 1 ♂, Salisbury, v.1956 (*E. T. M. Reid*). NATAL: 1 ♀, Weenen, iii.1924 (*H. P. Thomasset*). The type localities are additional to these.

Stictochironomus puripennis Kieffer

Polypedilum puripenne Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1): 97.
Stictochironomus albipes Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23**: 21.
Stictochironomus puripenne Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2**: 378.

A dark brown species with mottled thorax and grey seamed wings, legs not ringed, not unlike *caffrarius* in general appearance but easily distinguished by plainer wings and absence of strong pruinosity on lateral stripes; most similar to *fusiformis* but in that species the thorax is more strongly pruinose, and the size smaller.

Male. Wing length 3–4 mm.

Head, mouthparts and antennae dark brown or blackish, A.R. about 2·5. *Thorax* dark brown or blackish with pruinose mottling and with lines of pruinosity between the stripes, central tubercle present. *Legs* whitish, femora brown except at apex, L.R. 1·3, front tarsi with thin beard, pulvilli very small. *Wings* whitish, veins seamed with grey and with a short grey mark at the apex of cell R_{4+5} as in *fusiformis* ; halteres white. *Abdomen* black, sometimes paler at the base laterally. Hypopygium (Text-fig. 6, *c*) with appendage 1 curved, appendage 2 lacking long apical hair, style more or less oval.

Female resembles male.

I have seen the holotype of *puripenne* which is in the South African Museum (type locality TRANSVAAL : Kaapmuiden) ; the holotype male of *albipes* is in the British Museum (type locality ABYSSINIA : Waldia).

DISTRIBUTION. NIGERIA : 1 ♂, 1 ♀, Zaria, xi.1956 (*B. McMillan*). ABYSSINIA : holotype ♂ of *albipes*, Waldia. S. RHODESIA : 1 ♂, 1 ♀, paratypes of *albipes*, Melsetter ; 1 ♀, Salisbury, iv.1956 (*E. T. M. Reid*). NATAL : 5 ♂, 4 ♀ and 3 ♂, 4 ♀, paratypes of *albipes*, Weenen. CAPE PROVINCE : 1 ♀, paratype of *albipes*, Piquetberg ; 1 ♀, Deelfontein (*Sloggett*) ; 1 ♀, Ceres (*R. E. Turner*) ; 1 ♂, 33 ♀, Ladismith (*P. Brinck*) ; 2 ♂, 22 ♀, Rhodes (*P. Brinck*). ORANGE FREE STATE : 1 ♀, Zastron (*P. Brinck*). S. W. AFRICA : 2 ♀, Kaokoveld (*P. Brinck*).

Stictochironomus fusiformis Kieffer

Polypedilum fusiforme Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 99 ; Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 30.

Stictochironomus puripenne Freeman, 1957, *Mém. Inst. Sci. nat. belg.* **8** : 197 (not Kieffer, 1921, *Ann. Soc. sci. Brux.* **41** (1) : 97).

This species is similar to *puripennis* in colour and structure, although appendage 1 of the male hypopygium is possibly shorter, but it differs in size (wing length 1·5–2·0 mm.) and in the thorax being more uniformly and strongly pruinose ; wing pattern (Pl. 2, fig. *d*) similar to *puripennis* but perhaps stronger. As a name is available for it, I am retaining it as a distinct species, although it may eventually prove only to be a small form of *puripennis*.

The holotype female is lost (type locality SUDAN : Mongola) but the description leaves no doubt over its identity.

DISTRIBUTION. NIGERIA : 19 ♂, 3 ♀, Kankiya, x.1956 (*B. McMillan*). SUDAN : 5 ♂, 1 ♀, Liednum nr. Wau, iii–iv.1955 (*E. T. M. Reid*). BELGIAN CONGO : 3 ♂, Albertville, viii.1953 (*J. Verbeke*).

Stictochironomus bisignatus Kieffer

Chironomus bisignatus Kieffer, 1918, *Ann. Mus. nat. Hung.* **16** : 67.

Thorax with bluish white pruinosity, legs pale, knees blackish, wings with two broad transverse bands, abdomen yellow, segments 1–5 black apically. This is a distinctively coloured and easily recognized species, not very typical of the genus. However, the size of the prothorax, absence of anterior tibial spur and fused posterior combs, suggest that it is best placed here. I have been able to borrow the type and can confirm the identification.

Male. Wing length 2–2·5 mm.

Head brown, palpi darker, pedicel reddish, A.R. about 1·5. *Thorax* reddish brown, postnotum and pleura darker, whole thorax pruinose, pruinosity with a brilliant bluish tinge on shoulders and centrally on the pleura; acrostichal bristles completely absent, central tubercle not developed. *Legs* yellow, knees and apices of tibiae blackened, L.R. 1·75, tarsal beard absent, tibial scale quite large but rounded, pulvilli large. *Wings* (Pl. 2, fig. *e* of female) with conspicuous pattern formed of two broad transverse dark bands, usually more or less joined along M_{3+4} by a fainter grey shadow; halteres dark brown or blackish. *Abdomen* yellow with dark bands at apices of segments 1–5, sometimes encroaching on to bases of succeeding segments, segments 6–9 dark, styles pale. Hypopygium (Text-fig. 6, *d*) with narrow styles, appendage 1 broad, appendage 2 small, anal point stout and fringed with stout bristles as shown.

Female resembles male, abdomen not so clearly marked, antennae probably 6-segmented.

I have seen the holotype male which was in the Hungarian National Museum (type locality NATAL: Sarnia).

DISTRIBUTION. CAPE PROVINCE: 1 ♀, Ceres, iv.1925 (*R. E. Turner*). NATAL: 1 ♀, Kloof, ix.1926 (*R. E. Turner*). S. RHODESIA: 1 ♀, Salisbury, iv.1956 (*E. T. M. Reid*). TANGANYIKA: 1 ♂, Njombe, xi.1947 (*W. Peters*). BELGIAN CONGO: 6 ♂, 2 ♀, Elisabethville, ii.1938, iv.1938 and xii.1938 (*H. J. Brédo*). KENYA: 1 ♂, Ruiru, vi.1932 (*H. C. James*).

Genus *MICROTENDIPES* Kieffer

Microtendipes Kieffer, 1915, *Broteria, Sér. Zool.* **13**: 70; Edwards, 1929, *Trans. ent. Soc. Lond.* **77**: 396; Townes, 1945, *Amer. midl. Nat.* **34**: 22; Freeman, 1955, *Explor. Parc Nat. Albert, Miss. de Witte*, **83**: 31 (not Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 8—see *Polypedilum*).

Kribiomimus Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1): 271; Kieffer, 1921, *Ann. Soc. ent. France*, **90**: 49 (SYN. NOV.).

Kribiocharis Kieffer, 1921, *Ann. Soc. ent. France*, **90**: 29 (in part).

Hulstaertiella Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 456.

Antennae of male with 14 segments, of female with either 6 or 7; frontal tubercles absent. Pronotum reduced, divided in the middle and overhung by mesonotum, much as in *Stenochironomus*; mesonotum without central tubercle; dorso-central bristles present as a clear row, but acrostichals reduced to a group at the apex of the mesonotal cone. Anterior tibia more or less truncate at the apex, scale not produced at all and no spur present; combs of other tibiae separate, one spur on each pair; pulvilli present but often small, not divided longitudinally; anterior femur of male sometimes with a tuft of bristles near the apex pointing towards the base. Wing membrane without macrotrichia, with or without dark markings; squama with complete fringe; R_{2+3} lying very close to R_1 apically and often almost indistinguishable from it at the tip, posterior fork either below or slightly beyond cross-vein Male with VIIIth abdominal tergite not contracted basally, styles more or less oval, appendage 1 curved, 2 without long apical hair.

Microtendipes can easily be recognized by the reduced prothorax and acrostichal bristles, approximation of R_1 and R_{2+3}, presence of only one tibial spur and reduced tibial scale. Although superficially resembling *Stenochironomus*, these characters combined with the quite different male hypopygium render it readily distinguishable.

As explained in 1955, I have emended the definition given by Edwards (1929) so as to include African species with patterned wings and 6-segmented female antennae. This causes *Hulstaertiella* to be a synonym. *Kribiocharis* (type *K. filitarsis* fixed by Freeman, 1955) included five species belonging to at least three genera and possibly more. I have been able to recognize three of these with certainty another with less certainty, and the last one not at all, but I have given a description of it below, taken from the original. *Kribiomimus* falls as a synonym because the type species, *K. bifasciatus* Kieffer, is a species of *Microtendipes*. Of the other species placed in *Kribiomimus* by Kieffer in 1921, one is probably another species of *Microtendipes*, another falls into *Polypedilum* and the last seems best placed in *Lauterborniella*.

Kieffer used the genus *Microtendipes* in his 1921–22 papers in *Ann. Soc. ent. France* for ten species with the scale of the anterior tibia pointed or apically setiform. Those that I have been able to recognize are all species of *Polypedilum* and it is probable that the others belong there too, because of the shape of the scale : they certainly cannot be admitted to *Microtendipes* as used now. These species are all treated under *Polypedilum*.

KEY TO THE AFRICAN SPECIES OF *Microtendipes*

1. Wings quite unmarked 2
   Wings with distinct clouds or spots or with a median transverse cloud 3
2. Anterior femur only narrowly dark at apex, in male without group of basally directed bristles ; thorax green with reddish stripes ; basal halves or more of abdominal segments 2–5 dark . . . . *lamprogaster* Kieffer
   Anterior femur with at least apical third dark, in male group of basally directed bristles present ; thorax mainly or entirely black ; abdomen of male with segments 1–5 unmarked greenish yellow . . . . *satchelli* Freeman
3. Wing markings in form of a faint transverse cloud or with apical half faintly clouded (Pl. 2, fig. *f*) . . . . *umbrosus* Freeman
   Wings either with distinct spots or heavily marked 4
4. Wings with a dark mark at apex 5
   Apex of wings clear 6
5. Wing pattern in form of numerous small rounded spots (Pl. 2, figs. *i*, *j*) exact arrangement variable . . . . *lentiginosus* Freeman
   Wing pattern not like this, formed of few discrete spots as in Pl. 2, fig. *g* *albus* Goetghebuer
6. Wings with seven spots (Pl. 2, fig. *h*), two being in posterior fork cell . *taitae* Kieffer
   Wing pattern more extensive and not in form of discrete spots 7
7. Femora with dark central ring, knees and apices of other segments dark ; cell R_{4+5} either with the basal two-thirds dark or with a pale area in the middle of this dark cloud ; pale spot in anal cell well basal to posterior fork (Pl. 2, figs. *k*, *l*) *bifasciatus* Kieffer
   Legs unmarked 8
8. Wings with a single transverse band which spreads out posteriorly in anal and fork cells . . . . *luteipes* Kieffer
   Wings with two transverse bands connected by a grey tract in cell M_{1+2} *flavipes* Kieffer

Microtendipes lamprogaster Kieffer

Chironomus (*Tendipes*) *lamprogaster* Kieffer, 1914, *Ann. S. Afr. Mus.* **10** : 266.
Microtendipes lamprogaster Kieffer, 1923, *Ann. Soc. sci. Brux.* **42** (1) : 387 ; *Freeman*, 1955, *S. Afr. Animal Life.* Uppsala, **2** : 378.

Wings unmarked, thorax with reddish stripes, knees of anterior legs dark, abdomen with basal dark markings on segments 2–5. It is most like *satchelli* and *umbrosus*, but can be distinguished from the former as shown in the key and from the latter by the plain wings and black marked abdomen.

Male. Wing length 3·25–3·5 mm.

Head greenish, palpi brown, pedicel reddish, A.R. about 2·4, frontal tubercles absent. *Thorax* yellowish green, stripes reddish brown and separate, postnotum and sternopleuron dark brown. *Legs* yellowish green, knees and apices of tibiae darkened, anterior femur with about one-sixth darkened, tibia with basal quarter dark, femur lacking basally directed patch of bristles, L.R. barely 1, anterior tarsus not bearded. *Wings* quite unmarked, venation normal, halteres pale. *Abdomen* greenish, segment 1 with obscure brown markings, 2–4 with a dark basal ring occupying about one-third of segment, usually extended in the mid-line almost to the posterior border, segment 5 similar but less well marked, 6–9 more completely dark. Hypopygium (Text-fig. 7, *a*) not differing from other species of the genus.

Female similar to male but abdominal markings less well developed ; antennae more or less 7-segmented, segments 2 and 3 being only indistinctly separated.

I have been able to borrow cotypes from the South African Museum (type locality Cape Town).

DISTRIBUTION. Known only from CAPE PROVINCE. Berg River, French Hoek, xii.1952, 4 ♂, 2 ♀ (*K. M. F. Scott*) and 1 ♂, 1 ♀, xi.1951 (*P. Brinck*) ; Ceres, 1 ♂, xi.1920 (*R. E. Turner*).

Microtendipes satchelli Freeman

Microtendipes satchelli Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2** : 379.

Easily distinguished from other African species by the colour, closest to *lamprogaster* but separated by the wider dark apex of the anterior femur, darker thorax and pale unmarked basal abdominal segments ; male with patch of basally directed bristles on anterior femur. This and *lamprogaster* are the only two African species known to me with plain wings.

Male. Wing length 3·5 mm.

Head reddish yellow or brown, face paler, palpi darker, antennae reddish, pedicel may be dark, plumes whitish at the apex, A.R. 2·5–3·0. *Thorax* with mesonotal stripes brown or black and more or less fused across, shoulders may be greenish, prescutellar area sometimes paler and pruinose ; scutellum, postnotum and pleura dark brown ; specimens from Elisabethville have the thorax almost entirely black. *Legs* yellowish green except for apical third or half of anterior femur and basal third and apex of anterior tibia which are blackish, other knees with traces of darkening ; L.R. about 1·2, anterior femur with a subapical patch of setae directed towards the base. *Wings* quite unmarked, halteres yellow. *Abdomen* with segments 1–5 yellowish green and unmarked, remainder dark ; hypopygium similar to *lamprogaster*.

Female not unlike male in colour and pattern but thoracic stripes separate, cuticle between yellowish brown ; abdomen less obviously pale on basal 5 segments, antennae more or less 7-segmented.

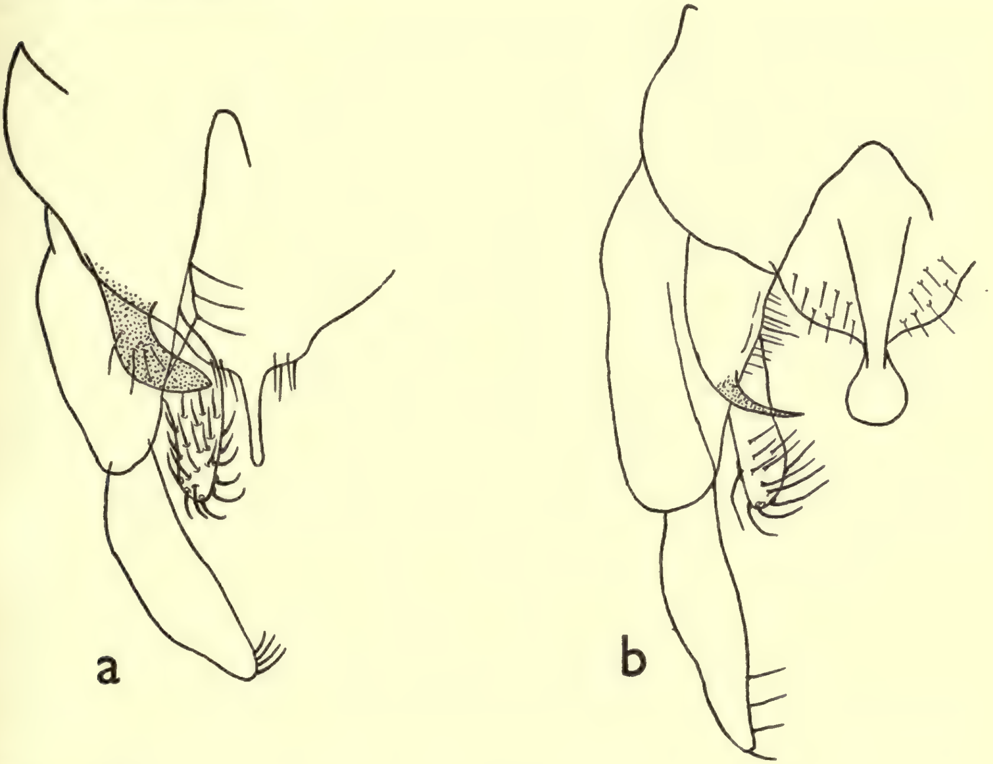

FIG. 7. Male hypopygia of *Microtendipes* and *Kribiocosmus*. *(a) M. lamprogaster ; (b) K. ornatipes.*

Holotype male in the British Museum.

DISTRIBUTION. CAPE PROVINCE : holotype male and 1 ♂ paratype, Transkei, Mt. Currie, Kokstad, iii.1953 (*G. H. Satchell*). BASUTOLAND : 2 ♂, Maseru, Lancer's Gap, iii.1951 (*P. Brinck*). BELGIAN CONGO : 12 ♂, 5 ♀, Elisabethville, iii.1939 (*H. J. Brédo*).

Microtendipes umbrosus Freeman

Microtendipes umbrosus Freeman, 1955, *Explor. Parc Nat. Albert,* Miss. de Witte, **83** : 32, Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2** : 378.

A medium-sized yellowish brown species with darker markings on thorax, especially on lateral stripes ; female antennae more or less 7-segmented ; legs with knees dark and a dark ring near the middle of the anterior femur ; wings with a median transverse dark band or shade ; abdomen pale on segments 1–5 or pale with narrow dark rings. Distinguished from species with similar body markings such as *satchelli* by the wing markings and the anterior femoral ring.

Male. Wing length 2·5–3·75 mm.

Head yellowish brown, mouthparts dark ; antennal pedicel reddish, plumes paler towards apex, A.R. 2–2·3. *Thorax* with pale shoulders which may be almost whitish ; stripes brown, lateral ones usually darker brown, stripes more or less fused across thorax, postnotum and sternopleuron dark brown. *Legs* yellowish white, all knees and apices of tibiae dark ; anterior knees more broadly darkened so that basal third or more of tibia may be black ; anterior femur with broad dark ring distal to the middle, other femora with traces of a similar ring ; anterior tarsal segments dark at extreme apices ; anterior femur with patch of setae directed basally, L.R. 1·2. *Wings* with a central dark shade or band (Pl. 2, fig. *f* of female), hardly extending basal to posterior fork but sometimes extending in cell R_{4+5} towards apex so that a good deal of apical half appears shaded ; halteres pale. *Abdomen* with segments 1–5 unmarked yellowish white in most specimens, occasionally with narrow dark rings at apices of segments, apical segments dark, hypopygium similar to *lamprogaster*.

Female essentially similar to male but darker in colour and wing and leg markings more extensive ; ring on posterior femora more distinct, that of anterior femur may be partially joined to apical darkening ; abdomen not always distinctly paler on basal 5 segments ; antennae more or less 7-segmented.

Holotype female in the British Museum.

DISTRIBUTION. KENYA : holotype female and 1 ♂, 1 ♀ paratype, Nyanza, Lumbwa Distr., xii.1911 (*C. M. Dotts*). SUDAN : 1 ♂, 4 ♀, Jebel Marra, 6,000–8,000 ft., v–vi.1932 (*M. Steele*). NIGERIA : 8 ♂, 4 ♀, Kankiya, xii.1956–i.1957 (*B. McMillan*). BELGIAN CONGO : 7 ♀, Parc National Albert, Riv. Bishakishaki, iv.1934 (*de Witte*) ; 4 ♂, 3 ♀, Elisabethville, xi.1938–iii.1939 (*H. J. Brédo*) ; 1 ♂, Lwiro-Bukavu, v.1957 (*J. Hamon*). S. RHODESIA : 1 ♂, Mt. Chironda (*C. F. M. Swynnerton*) ; 1 ♀, Salisbury, ii–iii.1956 (*E. T. M. Reid*). TRANSVAAL : 1 ♀, Waterval, Lydenburg, iv.1955 (*A. D. Harrison*). S. W. AFRICA : 16 ♂, 4 ♀, Kaokoveld, Anabib (*P. Brinck*).

Microtendipes albus Goetghebuer

Polypedilum album Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 482.

Microtendipes rutshuruensis Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witt, **83** : 34 ; Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2** : 378 (SYN. NOV.).

A pale species with distinctively patterned wings, the cloud at the apex distinguishing it from other African species except *filitarsus* and *lentiginosus* ; it is separated from the former by the presence of dark markings at the apices of tibiae and tarsal segments and from the latter by the quite different wing pattern. I have examined Goetghebuer's type and find it to be the same species as *rutshuruensis*. He omitted the apical wing cloud from his figure although it is quite distinct on the specimen and his placing of the species in *Polypedilum* is wrong as it shows all the generic characters of *Microtendipes*.

Male. Wing length 2·5–3·0 mm.

Head, mouthparts and antennae reddish yellow, plumes whitish, A.R. about 2. *Thorax* with whitish yellow pruinose background ; stripes, especially lateral ones, postnotum and sternopleuron brown or dark brown. *Legs* whitish, anterior knees broadly black, middle and posterior knees less strongly marked, more brownish or with a ring above and below ; anterior femur with a central dark band which may be greatly reduced ; apices of all tibiae dark, apices of all tarsal segments broadly dark ; basitarsus without the central dark ring seen in the female but examination of more material may show that it usually is present ; L.R. 1·3, anterior femur with basally-directed patch of setae poorly developed. *Wings* similarly patterned to the female (Pl. 2, fig. *g*) ; apex clouded and with four more clouds as shown ; halteres pale. *Abdomen* yellowish white, incisures may be narrowly darkened, hypopygium as in *lamprogaster*.

Female. Wing length 2–3·5 mm.

Very similar to male in pattern, thorax may be considerably paler, legs have an additional dark band in centre of basitarsus ; antennae with 6 segments.

Holotype male of *album* in Musée Royal du Congo Belge, Tervuren, of *rutshuruensis* in the British Museum (both from BELGIAN CONGO : Rutshuru).

DISTRIBUTION. BELGIAN CONGO : type specimens from Rutshuru : 1 ♀, Elisabethville, ii.1939 (*H. J. Brédo*) ; 2 ♀, Lwiro-Bukavu, v.1957 (*J. Hamon*). TANGANYIKA : 2 ♀, Njombe, viii–ix.1951 (*W. Peters*). NATAL : 1 ♂, Weenen, viii.1924 (*H. P. Thomasset*) ; 4 ♀, Royal Natal National Park, iv.1951 (*P. Brinck*).

Microtendipes lentiginosus Freeman

Microtendipes lentiginosus Freeman, 1955, *Explor. Parc Nat. Upemba*, **35** : 100.

In general structure and in the colour of body and legs this species is extremely similar to *albus*, differing only in the presence of a central dark band on the femora of all legs and in the absence of a central basitarsal ring ; its size is smaller (wing length 2 mm. for all specimens). The main point of difference between it and all other species is the peculiar wing pattern (Pl. 2, figs. *i*, *j*) which is composed of numerous small rounded dark spots with blotches at the cross-vein, posterior fork and apex. The detailed number and arrangement of the spots differ not only from specimen to specimen but also on both sides of the same specimen ; fig. *i* of the holotype illustrates a paler specimen, the paratype in fig. *j* is a commoner pattern but darker ; more heavily patterned ones do occur.

Holotype female is in the collection of the Institut des Parcs nationaux du Congo Belge.

DISTRIBUTION. KENYA : 1 ♀ paratype, Kavirondo, ix.1911 (*C. N. Woodhouse*). BELGIAN CONGO : holotype female, Parc national de l'Upemba, x.1947 (*de Witte*) ; 2 ♂, 2 ♀, Elisabethville, xii.1938 and iv.1939 (*H. J. Brédo*). NATAL : 1 ♀, Bergville, xii.1954 (*W. D. Oliff*).

Microtendipes taitae Kieffer

Chironomus taitae Kieffer, 1913, *Voy. All. Jean. Afr. Or. Ins. Dipt.* **1** : 15.
Polypedilum (?) *annulaticrus* Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 31 (SYN. NOV.).

Thorax with brown stripes, abdomen of male yellow with dark incisures, legs dark at the knees and apices of tibiae and with a central dark band on the anterior femur ; easily distinguished from all other African species by the wing pattern which is formed of seven spots, two being in the posterior fork cell.

I have examined the series of cotypes of *taitae* and can confirm the identity of the species but the type of *annulaticrus* is lost. It cannot belong to *Polypedilum* because the eighth segment of the male abdomen is not contracted basally ; the presence of two spots in the posterior fork cell makes it reasonably certain that it is a redescription of *taitae*.

Male. Wing length 3·25–3·75 mm.

Head and pedicel yellowish brown, mouthparts blackish, A.R. 2·5. *Thorax* greenish brown ; stripes, postnotum and sternopleuron reddish or dark brown, shoulders and prescutellar area pruinose. *Legs* greenish or yellowish brown, broadly darkened at the knees, anterior femur with a broad dark ring beyond the middle, other femora sometimes with this ring or sometimes with the basal half darkened ; tibiae and tarsal segments dark at apices ; front femur with poorly developed patch of setae directed basally, L.R. 1·3. *Wings* (Pl. 2, fig. *h* of female) with well-developed pattern of seven spots, outer three more or less in a line across wing, posterior fork cell containing two ; exact extent of each spot variable to a limited extent, the larger one in cell R_{4+5} sometimes appearing double, the one behind it in cell M_{1+2} occasionally absent ; halteres pale. *Abdomen* with segments 1–5 yellowish white, incisures narrowly dark, apical segments more or less darkened ; hypopygium similar to *lamprogaster*.

Female similar to male in colour and pattern, antennae with 6 segments.

Cotypes of *taitae* are in Muséum National d'Histoire Naturelle, Paris (type locality KENYA : Taita) ; type of *annulaticrus* lost (type locality FRENCH CAMEROONS: Kribi).

DISTRIBUTION. GOLD COAST : 1 ♀, Nangodi, x.1954 (*G. Crisp*). KENYA : 1 ♂, 1 ♀, Nairobi, v.1911 (*T. J. Anderson*). BELGIAN CONGO : 1 ♂, Kalunga, x.1925 (*J. Schwetz*) ; 7 ♂, 9 ♀, Elisabethville, ii–iii.1939 (*H. J. Brédo*) ; 1 ♀, Elisabethville, ii.1934 (*C. Seydl*). N. RHODESIA : 1 ♀, Chilanga, ix.1913 (*R. C. Wood*). S. RHODESIA : 1 ♂, Chirinda Forest, xi.1930 (*A. Cuthbertson*) ; 1 ♀, Salisbury, ii–iii.1956 (*E. T. M. Reid*). NATAL : 1 ♀, Kloof, ix.1926 (*R. E. Turner*) ; 2 ♂, Rosetta, ix.1953 (*A. D. Harrison*).

Microtendipes bifasciatus Kieffer

Kribiomimus bifasciatus Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 51.
Kribiocharis annulaticrus Kieffer, 1922, *ibid.* **91** : 5 (SYN. NOV.).
Kribiocallis fasciatipennis Kieffer, 1922, *ibid.* **91** : 16 (SYN. NOV.).
Hulstaertiella caloptera Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 456 (SYN. NOV.).
Polypedilum bicinctum Goetghebuer, 1936, *ibid.* **28** : 483 (SYN. NOV.).

Wings heavily marked with two dark bands which are connected to a greater or lesser extent, apex clear and there are clear spots in fork and anal cells ; legs dark at knees, at apices of tibiae and tarsal segments and with a central dark femoral ring ; thorax with white pruinosity, abdomen of male pale, each segment with a dark ring basally. The wing markings, although variable in intensity, make this species easily recognizable. Although I have not seen the types, Kieffer's three species agree very well with my specimens. I have seen both of Goetghebuer's types and find that *bicinctum* was described from a pale male and *caloptera* from a dark female.

Male. Wing length 2·5–3·0 mm.

Head yellowish or brown, mouthparts brown, pedicel yellow, plumes white, at least apically, A.R. about 3. *Thorax* yellowish brown with white pruinosity on shoulders, between stripes and in prescutellar area. *Legs* yellowish white, knees broadly darkened, apices of tibiae and of tarsal segments dark, femora with a broad brown ring just beyond the middle ; anterior femora without the basally directed hair patch, L.R. 1·5. *Wings* heavily patterned as shown in Pl. 2, fig. *k* of female ; markings can be considered as formed of two dark bands one at level of apex of R_1, the other bounded basally by cross-vein r-m ; the two bands are more or less distinctly connected centrally leaving an oval clear area in cell R_{4+5} ; the outer band tends to creep along vein M_{1+2} and there is another clear spot between the bands in the fork cell ; basal band expands in anal cell which contains another dark basal spot, the area between the two is clear and more or less circular. *Abdomen* yellowish, each segment narrowly darkened basally ; hypopygium similar to *lamprogaster*.

Female resembles male but wing pattern more intense ; grey area connecting the two bands may cover cell R_{4+5} as well as M_{1+2} so that there appears to be only one broad and more or less continuous band relieved only by the spot in the fork cell ; these two extremes of intensity are shown in Pl. 2, figs. *k*, *l* ; antennae probably 6-segmented.

Type series of all three of Kieffer's species lost, type locality of all, FRENCH CAMEROONS : Kribi, *bifasciatus* was based on males, the other two on females. The types of Goetghebuer's species are in Musée Royal du Congo Belge, Tervuren.

DISTRIBUTION. SIERRA LEONE : 1 ♂, Njala, viii.1930 (*E. Hargreaves*). TANGANYIKA : 2 ♀, Njombe, ii.1952 (*W. Peters*). BELGIAN CONGO : 1 ♂, 3 ♀, Stanleyville (*Mouchet*) ; 1 ♀, Eala, v.1935 (*J. Ghesquière*) ; 1 ♀, Elisabethville, xii.1938 (*H. J. Brédo*) ; holotype male of *bicinctum*, Stanleyville, holotype female of *caloptera*, Flandria.

? *Microtendipes flavipes* Kieffer

Kribiomimus flavipes Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 52.

I have seen no specimens which agree with the description of this species. It probably belongs to *Microtendipes* because it is said by Kieffer to resemble *bifasciatus* of which it may be a teneral specimen. The main difference lies in the absence of dark markings on the legs which are completely yellow. The wing markings resemble those of *bifasciatus* with the two transverse bands joined by a grey band in cell M_{1+2}, hypopygium as in *bifasciatus*. Length 4–5 mm.

Known only from the holotype male which is lost, type locality FRENCH CAMEROONS : Kribi.

Microtendipes luteipes Kieffer

Kribiocharis luteipes Kieffer, 1922, *Ann. Soc. ent. France*, **91** : 3.

I have seen no specimens agreeing with the original description, but from the produced thorax, the figure of the male hypopygium and the square shape of the eighth segment of the male abdomen it probably belongs to this genus. It differs from all other species except *flavipes* by the unmarked pale legs ; it may be separated from *flavipes* by the presence of a single transverse dark band on the wing. The following description is taken from the original.

Length of male 3·8–4 mm., of female 3–3·5 mm.

Clear yellow. Male antennae brownish, A.R. 1·5, female antennae with 6 segments. Thorax prolonged above head, concolorous in female, but stripes, postnotum and sternopleuron yellow in male ; halteres white. Wings with fork cell and cell between the stem of the fork and the anal vein grey to the posterior border except for two clear spots on the border, the distal in the fork cell against Cu, the other at the extremity of the anal cell ; the other grey spots are : two confluent, together forming a transverse band going from R_{4+5} to M_{1+2} opposite the extremity of Cu and a grey tract on the proximal third of M_{1+2}. Legs entirely yellow, anterior femur equal to tibia, tarsi not bearded, L.R. more than 1, pulvilli short ; tibial scale rounded and transverse. Male abdomen yellowish white, incisures darker, VIIIth tergite square ; hypopygium, from the figure, very similar to *lamprogaster*. One female is mentioned with the whole of cell R_{4+5} grey, though paler in colour than the spots.

Known only from the type series now lost, type locality FRENCH CAMEROONS : Kribi.

Genus ***KRIBIOCOSMUS*** Kieffer

Kribiocosmus Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 271 ; Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 48.

Eyes rather widely separated above, narrow portion hardly longer than wide, frontal tubercles absent, palpi well developed and thick, clothed with more bristly hairs than is usual, A.R. of the only known species about 0·6, female antennae not known. Prothorax reaching nearly to front of mesonotum, but not visible from above, dorso-central and acrostichal bristles both well developed. Anterior tibial scale triangular and with a narrow slightly curved spur at the apex as long as the scale itself ; combs of other tibiae fused, each pair with a single short spur ; pulvilli not visible with a binocular microscope. Wings clouded, R_{2+3} ending midway between R_1 and R_{4+5}, posterior fork below cross-vein, squama fringed. Male abdomen with eighth segment not constricted at the base ; two hypopygial appendages present, coxite and style narrow.

This genus was described by Kieffer to include the only known species *K. ornatipes* Kieffer which is automatically the type species of the genus. In general appearance and in the structure of the front tibial spur it resembles *Lauterborniella* but the combs on the other tibiae are more like those of *Stictochironomus*. These characters combined with the virtual absence of pulvilli are sufficient to separate it from all other described genera.

Kribiocosmus ornatipes Kieffer

Kribiocosmus ornatipes Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 48.

Mesonotum with strongly developed pruinosity along the hair lines, legs dark but tarsi banded with yellow, wings distinctively clouded, anal point of male broadened at tip.

Male. Wing length 2 mm.

Head yellowish-brown, palpi darker, antennae with reddish pedicel, flagellum with segments 1–4 whitish, plumes rather sparse, A.R. only 0·6. *Thorax* brown and with a pair of broad and conspicuous silvery pruinose stripes along lines of dorso-central bristles from anterior to posterior margins of mesonotum ; line of acrostichal bristles less obviously pruinose. *Legs* brown with yellow markings ; coxae, bases of femora, knees of posterior four legs pale ; anterior basitarsus pale with dark apex, second and third segments narrowly pale basally, 4 and 5 completely dark ; L.R. 1·75, tarsal beard absent ; basitarsus of other legs with a broad median pale band, segments 2 and 3 broadly pale basally, remainder dark. *Wings* (Pl. 2, fig. *m*) clouded, cell R_{4+5} with clouds basally, beyond the centre and at the apex, fork cell with a central cloud, anal cell with two ; halteres yellow. *Abdomen* dark brown. Hypopygium (Text-fig. 7, *b*) quite characteristic ; anal point downturned and broadened at the apex, appendage 1 narrow and sharply pointed, appearing as a continuation of a curved ridge on the coxite, appendage 2 short and without long apical hair, styles narrow and contracted apically.

Female. So far as can be seen from the only, rather damaged, specimen available, similar to male ; antennae broken.

I have not seen the holotype male which is probably lost (type locality FRENCH CAMEROONS : Kribi) but it can easily be identified from Kieffer's description and figure.

DISTRIBUTION. GOLD COAST : 1 ♂, Koforidua, vii.1919 (*F. H. Storey*) ; 2 ♂, 1 ♀, Bolgatanga, xi.1954 (*G. Crisp*). FRENCH WEST AFRICA, SOUDAN : 1 ♂, Bamako, xi.1953 (*J. Hamon*). BELGIAN CONGO : 1 ♂, Stanleyville, viii.1928 (*A. Collart*).

Genus ***LAUTERBORNIELLA*** Bause

Lauterborniella Bause, 1914, *Arch. Hydrobiol. Suppl.* **2** : 120 ; Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 28 ; Townes, 1945, *Amer. midl. Nat.* **34** : 19.

Zavreliella Kieffer, 1920, *Bull. Soc. ent. France*, **1919** : 334.

Kribiodorum Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 270 ; Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 46.

Chironomus subg. *Lauterborniella* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 404.

Male antenna with 13 or 14 segments, the last two often indistinctly separated, female with 6–7 segments ; frontal tubercles absent. Pronotum reduced and not visible from above. Anterior tibia usually with a short sharp spur or triangular pointed scale; combs of posterior tibiae separate, the smaller with a spur which may be long and strong; pulvilli well developed. Wings with R_{2+3} ending beyond tip of R_1, squama bare. Eighth segment of male abdomen not contracted basally, usually two hypopygial appendages, but in one species *2a* is present as well.

The four African species which I am placing in this genus are probably not all very closely allied to one another; *pulchra* is closely allied to a North American species and *fuscoguttata* may be a synonym of a European species. These two and *longiventris* would belong to the subgenus *Zavreliella*, but following Townes (1945) I prefer not to recognize this as a distinct subgenus.

KEY TO AFRICAN SPECIES OF *Lauterborniella*

1. Legs completely yellow, without dark markings; wings with two grey transverse bands (Pl. 2, fig. *q*) . . . . *pallidipes* Kieffer
   Legs with dark markings, especially at apices of anterior femora 2
2. Wing pattern as in Pl. 2, fig. *n*; fork cell with three dark spots . *fuscoguttata* Kieffer
   Wing pattern not so obviously in form of dark spots, apex more or less clear . 3
3. Wing with clear areas forming two bands (Pl. 2, fig. *o*) . . . *pulchra* Kieffer
   Clear areas not like this (Pl. 2, fig. *p*) . . . . *longiventris* Goetghebuer

Lauterborniella fuscoguttata Kieffer

Polypedilum fuscoguttatum Kieffer, 1922, *Ann. Soc. ent. France*, **91**: 37.

Blackish or dark brown, pruinose, wings heavily marked with eleven or twelve spots, fork cell with three spots. Legs pale, tarsi banded, abdomen with basal tuberosities on each segment dorsally, especially obvious in the male.

This species is easily recognized by the wing pattern, banded tarsi and abdominal tuberosities. It is doubtfully distinct from the parthenogenetic European species *L. marmorata* van der Wulp, but I am maintaining the separation until such time as males are known of the latter or until more is known of their biology. The North American species *L. varipennis* Coquillett may well prove to be another synonym, judging from the description given by Townes (1945). He distinguishes Coquillett's species from the European one by the absence in the latter of the abdominal tuberosities, by its heavier wing markings and constant single spurred condition of the posterior tibia. In actual fact the tuberosities are present, but as they are not strongly developed in females, have not been mentioned in the literature.

Male. Wing length 1·75 mm.

Head, mouthparts and pedicel of antennae dark brown or blackish, A.R. about 1·2. *Thorax* dark brown or blackish, marbled with pruinosity. *Legs* yellowish with darker markings, anterior femur clubbed on apical half which is black, other femora dark on basal halves; anterior tibia black, knee pale, other tibiae blackish at tips; all tarsal segments dark at apices. Anterior tibia about half as long as femur, L.R. 2·5, tibial spur well developed and straight; small comb of posterior tibia projecting beyond other comb and twisted to give a characteristic appearance. *Wings* (Pl. 2, fig. *n* of female) with heavy pattern, the three spots in the fork cell being especially characteristic; squama bare, halteres white. *Abdomen* black, hypopygium paler; each segment with an oval, longitudinal, ridge or tuberosity in its basal half and a silvery pruinose patch on its apical half, each ridge bears a tuft of hair. Hypopygium (Text-fig. 8, *a*) very similar to the North American species *L. varipennis*.

Female similar to male but abdominal tuberosities less strongly developed, antennae with 6 segments.

Cotype females probably lost (type locality SUDAN: Shambe).

DISTRIBUTION. SUDAN: 8 ♀, Melut, Tonga and Adok, xi.1953 (*E. T. M. Reid*); 1 ♀, Rumbek, vi–vii.1954 (*E. T. M. Reid*); 1 ♂, 5 ♀, near Wau, iii–iv.1955 (*E. T. M. Reid*). NIGERIA: 1 ♂, Kankiya, xii.1956–i.1957 (*B. McMillan*). FRENCH WEST AFRICA, Haute Volta: 3 ♂, 1 ♀, Tangrela nr. Banfora, xii.1956 (*J. Hamon*). S. RHODESIA: 1 ♀, Salisbury, iv.1956 (*E. T. M. Reid*).

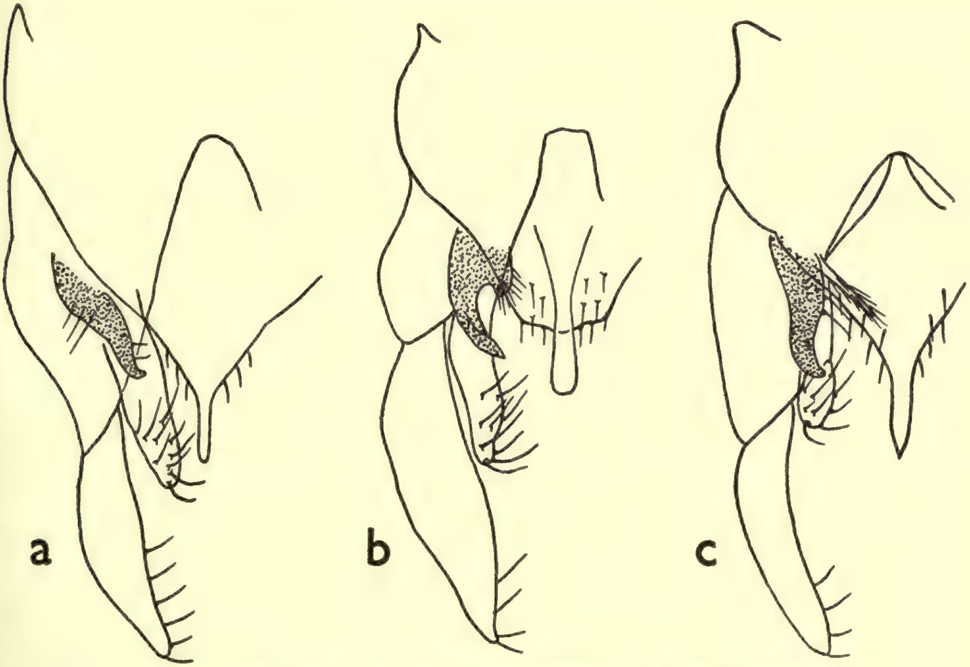

FIG. 8. Male hypopygia of *Lauterborniella*. (*a*) *L. fuscoguttata*; (*b*) *L. pulchra*; (*c*) *L. pallidipes*.

Lauterborniella pulchra Kieffer

Kribiodorum pulchrum Kieffer, 1921, *Ann. Soc. ent. France*, **90**: 46.
Paratendipes violaceus Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 458 (SYN. NOV.).

Thorax greenish or yellowish, legs variably banded with black, anterior femur more or less swollen at apex which is always black, anterior tibia always pure white on basal half or more; wings brown or blackish with clear areas at the apex and others forming a median band. The leg and wing markings are sufficient to distinguish it from all other African species known to me. It shows a strong resemblance in appearance, structure and pattern to the North American species *L. perpulcher* Mitchell but it may be distinguished by the wings being dark right to the base and by the shape and arrangement of the clear areas in the fork cell and anal cell.

It is easily recognized from Kieffer's description and I have been able to examine Goetghebuer's type and can confirm the synonymy. It is not clear why Goetghebuer placed it in *Paratendipes*, but it may be because the number of tibial spurs is difficult to determine from his specimen ; he has also confused the legs in his figure, because on the holotype the middle tarsi are present and the posterior ones broken, whereas in his drawing tarsi are present on hind legs only. The dark colour of his type is probably caused by scorching which often makes material taken at light unnaturally dark.

Male. Wing length 1·75–2·0 mm.

Head greenish or yellowish, pedicel yellowish brown, A.R. about 1·0, palpi yellow. *Thorax* greenish or yellowish with reddish yellow stripes, postnotum dark, pleura with a broad horizontal dark stripe which continues the colour of the abdomen. *Legs* yellow with variable dark and white markings ; anterior femur slightly swollen apically, apical third always black, all femora may have a broad dark ring near the middle, posterior femora may be dark at apices as well ; anterior tibia strikingly white on basal half or two-thirds, apical half or third black, other tibiae either completely yellow or else white basally and with an indefinite broad dark median band ; anterior tarsi of males all broken but in females anterior basitarsus pale on basal half, other segments dark, tarsal segments of other legs broadly dark at apices ; L.R. of females about 2, anterior tibial spur long and curved, scale reduced, spur often broken. *Wings* (Pl. 2, fig. *o* of female) brown or blackish with pale areas as shown, though these are variable in extent ; squama bare. Halteres green or yellow. *Abdomen* brown, each segment indefinitely paler in basal half or more, hypopygium white. Hypopygium (Text-fig. 8, *b*) very similar to that of *L. perpulcher* Mitchell (North America).

Female very similar to male in colour, general structure and pattern ; antennae with 7 segments, 1–6 may be white, 7 is always dark.

I have not seen the type series of *pulchra* which is probably lost (type locality FRENCH CAMEROONS : Kribi) ; holotype ♀ of *violaceus* is in the Musée Royal du Congo Belge, Tervuren (BELGIAN CONGO : Rutshuru).

DISTRIBUTION. GOLD COAST : 1 ♀, Kete Krachi, x.1898 (*Graf Zech*). SUDAN : 6 ♂, 6 ♀, Khartoum, x.1951 (*D. J. Lewis*) ; 1 ♀, Amadi, vi–vii.1954 (*E. T. M. Reid*). NATAL : 1 ♀, Howick, iv.1953 (*G. H. Satchell*). The type localities are additional.

Lauterborniella longiventris Goetghebuer

Kribiomimus longiventris Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28** : 454.

Thorax greenish with reddish mesonotal stripes and dark pleural stripe ; legs golden, apices of segments broadly blackened, anterior tibiae with spur ; wings heavily patterned, apex clear ; abdomen blackish, each segment pruinose at extreme apex. Only the holotype is known ; the general appearance, bare squama, slightly clubbed anterior femur and spurred anterior tibia place it in *Lauterborniella* near *pulchra*. Through the kindness of Dr. P. L. G. Benoit I have been able to include a photograph of the wing.

Male. Wing length 2·75 mm., body length 5 mm. (not 7 mm. as stated by Goetghebuer).

Head brown, A.R. 1·75 (not 2·5 as stated by Goetghebuer). *Thorax* greenish, stripes and sternopleuron reddish brown, horizontal pleural stripe and postnotum black. *Legs* golden yellow, anterior femur slightly clubbed, apical quarter of all femora and third of tibiae black, segments 1–4 of anterior tarsus with apical thirds black, on other legs black at tips ; in addition traces of black bands present at middle of femora and at bases of tibiae. Anterior tibia appears to have well-formed long spur at apex of small oval scale, spur of other tibiae short, L.R. 2·0. *Wings* mainly dark, but apex and a large spot in fork cell clear, other spots as shown in Pl. 2, fig. *p* ; squama bare, halteres yellow. *Abdomen* blackish with golden hairs and traces of paler colouring on segments 2 and 5 ; each segment with narrow pruinose band at apex. Hypopygium broken but anal point long and appendage 1 hook-like as seen in dried specimen.

Female not known.

I have seen the holotype male in Musée Royal du Congo Belge, Tervuren, type locality, BELGIAN CONGO : Kasai, Ilebo. No other specimens are known to me.

Lauterborniella pallidipes Kieffer

Kribiomimus pallidipes Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 52.

Thorax yellowish or reddish with a dark lateral stripe on pleuron, abdomen blackish ; legs yellow without dark markings, tibial scale oval, spur absent, posterior tibial spur long and curved ; wings with two transverse grey bands ; male hypopygium with appendage 2*a* present. It can easily be distinguished from the other African species by the pale legs and by the wing pattern ; in some ways, for instance in the absence of a long anterior tibial spur and in the presence of appendage 2*a*, it is not very typical of the genus, but the bare squama, long posterior tibial spur and presence of pulvilli, cause it to fall here better than into any other genus.

Male. Wing length 1·5–1·75 mm.

Head yellowish brown, palpi yellow, pedicel brownish, A.R. about 1·2. *Thorax* yellowish, mesonotal stripes reddish, postnotum and a lateral horizontal pleural stripe dark brown. *Legs* yellow and without markings ; anterior tibial scale oval and without spur or spine, although a very short dark point can sometimes be seen at the apex, L.R. about 2·2, pulvilli present, tarsal beard absent ; posterior tibial combs not fused, with one long spur, curved at the apex. *Wings* (Pl. 2, fig. *q* of female) with two grey transverse bands, one at level of cross-vein and the other at level of apex of R_{2+3} ; squama bare. *Abdomen* blackish, hypopygium not paler ; hypopygium (Text-fig. 8 *c*) with stout anal point and three appendages ; appendage 2*a* straight and hairy, styles slightly curved. coxites long.

Female similar to male, antennae with 6 segments.

The type series is probably lost (FRENCH CAMEROONS : Kribi).

DISTRIBUTION. SIERRA LEONE : 1 ♂, 1 ♀, Pepel, i.1956 (*D. J. Lewis*). GOLD COAST : 1 ♀, Nangodi, x.1954 (*G. Crisp*). NIGERIA : 1 ♂, Katsina, x.1956 (*B. McMillan*) ; 1 ♂, Kankiya (*B. McMillan*). SUDAN : 1 ♂, 5 ♀, Melut, Adok, Shambe, xi.1953 (*E. T. M. Reid*) ; 4 ♂, 1 ♀, nr. Wau, iii.1955 (*E. T. M. Reid*). BELGIAN CONGO : 1 ♂, 5 ♀, Musosa, x.1939 and 3 ♂, 13 ♀, Elisabethville, iii.1939 (*H. J. Brédo*). S. RHODESIA : 1 ♀, Salisbury, iv.1956 (*E. T. M. Reid*).

Genus ***KRIBIODOSIS*** Kieffer

Kribiodosis Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 270 ; Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 40.

Male antennae with 13 or 14 segments, segmentation often indistinct, female antennae with 5 only, the last one being swollen at the base and formed by the fusion of 2 segments ; frontal tubercles absent. Pronotum reduced and not visible from above. Legs unusually long and thin, anterior femora and tibiae slightly clubbed at apices ; anterior tibia with a sharp spur arising from a reduced and transverse scale, combs of posterior tibiae separate and the smaller with a very long thin curved spur ; pulvilli scarcely distinguishable. Wings narrow and cuneiform, squama bare, R_{2+3} separated from R_1 at the apex, Cu_1 short, only about half as long as M_{3+4} (Text-fig. 9, *a*). Eighth segment of male abdomen contracted basally, hypopygium with two appendages.

This genus is very close to *Lauterborniella* in most of its characters but I prefer to keep it distinct until more species are known because its appearance is different with its long thin legs and narrow wings and also because the eighth segment of the male is basally contracted, the pulvilli are reduced and the female antenna has only 5 segments.

Kieffer described five African species all from the same locality, but I can see no reason for maintaining them as distinct from each other. No other species are known. Type species of the genus *K. clavigera* Kieffer by original citation (as *fasciata* Kieffer).

Kribiodosis clavigera Kieffer

Kribiodosis clavigera Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 41.
Kribiodosis fuscithorax Kieffer, 1921, *ibid.* **90** : 42 (SYN. NOV.).
Kribiodosis distans Kieffer, 1921, *ibid.* **90** : 42 (SYN. NOV.).
Kribiodosis fasciata Kieffer, 1921, *ibid.* **90** : 43 (SYN. NOV.).
Kribiodosis flaviventris Kieffer, 1921, *ibid.* **90** : 44 (SYN. NOV.).

A small dark species easily distinguished from other species of the subfamily by the narrow wings, bare squama, banded abdomen and the very long thin legs with the apices of femora and tibiae white.

All Kieffer's material was from the same locality and the differences between the species are mostly of colour ; three species were described from females alone, two from single specimens, the other two species (*fuscithorax* and *fasciata*) were known in both sexes. *K. clavigera* was separated mainly because the wings were feebly brown, but in the females available to me this is often so ; the main points of separation for the other four species lie in the colour and degree of fusion of the thoracic stripes and slight details of leg colour. However, as Kieffer's specimens were all in spirit these characters are very unreliable and I prefer to regard all as redescriptions of the same species, for which I am using the first of his names.

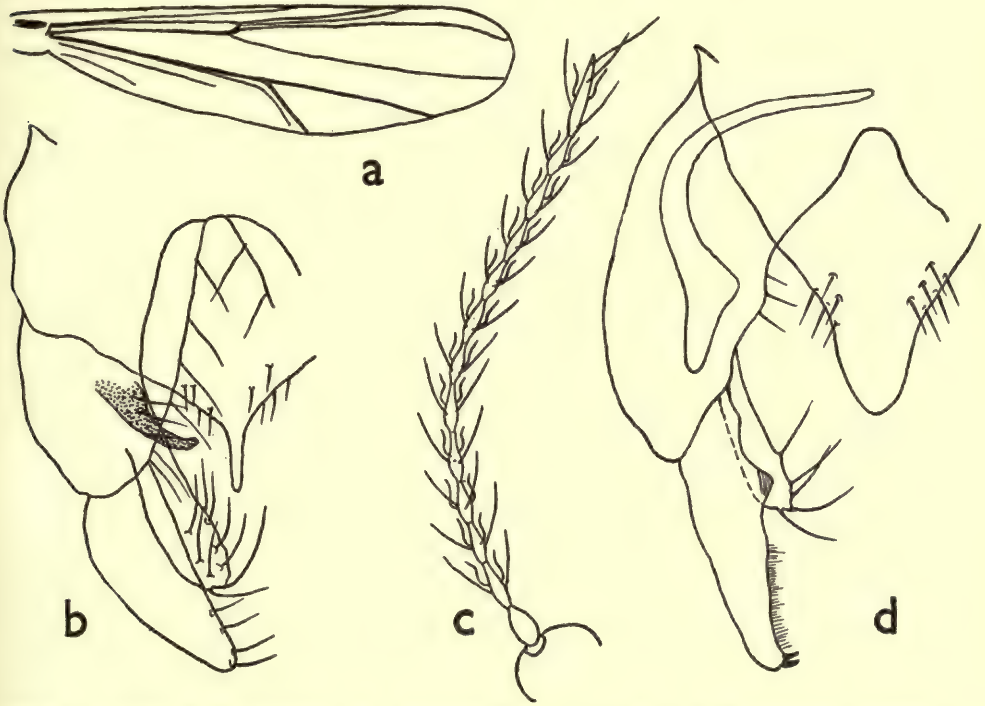

FIG. 9. Males of *Kribiodosis* and *Kribiothauma*. *(a)* Wing of *Kribiodosis clavigera ; (b)* hypopygium of the same ; *(c)* antenna of *Kribiothauma pulchellum ; (d)* hypopygium of the same.

Male. Wing length 1·3–1·5 mm.

Head, mouthparts and antennae brown, flagellum whitish at the base, segmentation of antennae indistinct but usually 13 segments are present. A.R. about 1 ; eyes rather close together above, narrow portion wider than usual, separation about half width of narrow portion. *Thorax* dark brown and shining, usually with some indication of darker stripes. *Legs* brown or yellowish brown, apices of femora and tibiae slightly clubbed and white, this is more noticeable on front legs than on others, femora may be rather darker just before white club ; legs long and thin, all femora subequal, anterior tibia half length of femur, other tibiae nearly as long as femora; L.R. 2·5, segment 4 of front tarsus with three strong bristles projecting inwardly, basitarsus of middle legs slightly shorter than tibia, of posterior legs slightly longer than tibia; pulvilli barely noticeable. *Wings* usually clear, venation and shape as in Text-fig. 9, *a*; squama bare, halteres white. *Abdomen* yellowish brown, each segment with a dark ring posteriorly, styles white; hypopygium (Text-fig. 9, *b*) without unusual features.

Female essentially similar to male in colour and structure although wings may be slightly smoky; fourth segment of anterior tarsus simple, antennae with 5 segments.

The types of all of Kieffer's species are lost, all were from FRENCH CAMEROONS: Kribi.

DISTRIBUTION. NIGERIA: 1 ♀, Abuja, xii.1954 (*R. W. Crosskey*). FRENCH WEST AFRICA: 19 ♂, Moami, nr. Bobo Dioulasso, xi.1956 (*J. Hamon*). BELGIAN CONGO: 1 ♂, 8 ♀, Elisabethville, ii–iv.1939 (*H. J. Brédo*); 2 ♀, Likimi, xii.1927 (*A. Collart*).

Genus ***LEPIDOPODUS*** gen. nov.

Male unknown, female antenna with 7 segments, eyes slightly wider apart above than below, frontal tubercles absent, palpi long. Prothorax reduced centrally but produced laterally as a short tubercle each side; acrostichal and dorso-central bristles both present as complete rows. Legs long and slender, more or less as in *Kribiodosis*, clothed with adpressed scales as well as erect bristles; anterior tibial scale without spur, posterior tibia with a single long spur which is on the large inner comb; pulvilli absent. Wings without macrotrichia, R_{2+3} separate from R_1 at apex, posterior fork beyond cross-vein, squama with incomplete fringe of 4–5 hairs.

Type species of the genus *Chironomus nigratipes* Kieffer, 1911.

Although only known from a single female the characters of the scales on the legs, curious prothorax and absence of both anterior tibial spur and also pulvilli are sufficient to distinguish it readily from all known genera. Although superficially like *Lauterborniella* and *Kribiodosis* it may not really be closely allied to them at all; a male is necessary before its exact affinities can be determined.

Lepidopodus nigratipes Kieffer

Chironomus nigratipes Kieffer, 1911, *Trans. Linn. Soc. Lond.* (*Zool.*) **14**: 358.

Brown, abdominal segments broadly pale apically, knees and apices of tibiae yellow. Distinguished from other species of the subfamily by the presence of adpressed scales on the legs and by the tuberculate prothorax.

Female. Wing length 2·25 mm.

Head, mouthparts and antennae brown, pedicel and basal flagellar segment yellow, antennal segments fusiform, segment 7 equal to 5 and 6 together. *Thorax* brown, slightly pruinose along hair lines and lateral margins. *Legs* brown, apices of femora, knees and apices of tibiae yellow, clothed with adpressed narrow scales as well as erect bristles; L.R. 2, anterior femur one and a half times as long as tibia, pulvilli absent. *Wings* unmarked, halteres pale. *Abdomen* brown, segments 2–6 with broad yellow apices, segment 1 completely yellow, cerci yellow.

The holotype female is in the British Museum ; type locality SEYCHELLES : Mahé ; no other specimens are known.

Genus ***KRIBIOTHAUMA*** Kieffer

Kribiothauma Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 270 ; Kieffer, 1921, *Ann. Soc. ent. France,* **90** : 39.

Male antenna with 14 segments, all flagellar segments more or less equal, the last not greatly elongated, without long plumes but with a whorl of about 4 short hairs (Text-fig. 9, *c*), sensory hairs well developed and sinuous ; female antenna with 7 segments ; frontal tubercles absent ; palpi of medium length only. Prothorax reduced, not visible from above, acrostichal and dorso-central bristles both present but short. Anterior tibia with strong curved spur, posterior tibia with a single spur, pulvilli present but not conspicuous. Wings broad and patterned, posterior fork short, R_{2+3} well separated from R_1, squama fringed. Eighth segment of male abdomen quadrate, ninth conical, appendage 1 absent, struts well developed, somewhat similar to those of species of Corynoneurinae.

Type and only known species of the genus *K. pulchellum* Kieffer, 1921.

The affinities of this aberrant genus are not very obvious but on adult structure it seems best placed with *Lauterborniella* and its allies. The peculiar structure of the male antenna is similar in males both from French Cameroons and from Transvaal and render the male easily recognizable. The female can be separated from *Lauterborniella* by the presence of a squamal fringe.

Kribiothauma pulchellum Kieffer

Kribiothauma pulchellum Kieffer, 1921, *Ann. Soc. ent. France,* **90** : 39.

A small species with heavily patterned wings, easily distinguished from other species by the peculiar male antennae, low L.R., presence of front tibial spur and squamal fringe and by the distinctive male hypopygium.

Male. Wing length 0·9 mm.

Head brown, antennae as in Text-fig. 9, *c*, pedicel yellow. *Thorax* brown, more yellow in the centre anteriorly, slightly pruinose. *Legs* brown, tarsi yellow, L.R. hardly more than 1. *Wings* blackish with clear spots as shown in Pl. 2, fig. *r* ; halteres black. *Abdomen* dark brown ; hypopygium (Text-fig. 9, *d*) with conical anal point, rounded at the apex, appendage 2 with about 5 hairs, styles with an inner projection near the base and two apical spines in the single specimen available to me.

Female not known to me, but similar to male according to Kieffer's description.

The type series is probably lost ; type locality FRENCH CAMEROONS : Kribi.

DISTRIBUTION. Apart from the type series known only from TRANSVAAL : 1 ♂, Great Usutu River, nr. Amsterdam, ix.1954 (*A. D. Harrison*).

Genus *KRIBIOXENUS* Kieffer

Kribioxenus Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 271 ; Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 29 and 53 (not Goetghebuer, 1928, Edwards, 1929 and Townes, 1945—see *Nilothauma*).

I have not seen any specimens that agree with such diagnosis as Kieffer gives in his keys, I cannot, therefore, give a full generic diagnosis. It is separated by Kieffer from other genera because the male antennae have 14 segments with A.R. 0·6, the anterior tibia a short bristle-like spur, the posterior tibia a single spur, pulvilli very short or absent and wings unmarked. The genus is monotypic and the type species is *K. pallidulus* Kieffer.

Although I have been unable satisfactorily to recognize any species as belonging to this genus, it is quite clear from a study of Kieffer's description of the type species that Goetghebuer and Edwards misidentified the genus when they placed *brayi* Goetghebuer here instead of in *Nilothauma*. I have dealt with this at greater length under *Nilothauma* in Part III of the present series of Studies. It is quite possible that *Kribioxenus* is a synonym of *Polypedilum* as mentioned below.

Kribioxenus pallidulus Kieffer

Kribioxenus pallidulus Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 53.

This was described from a yellowish white male, 1·2 mm. long, with mesonotal stripes and postnotum brown and anterior femur twice as long as the tibia. The male hypopygium as figured by Kieffer is shown with a widely triangular anal point with another wide plate beneath prolonged into a short lobe on its posterior margin. It seems probable that the latter is the true anal point and that the former is the VIIIth tergite into which the hypopygium has been telescoped.

It is not improbable that it is a small plain-winged species of *Polypedilum* close to or possibly synonymous with *P. melanophilus* Kieffer which also has a low antennal ratio.

Holotype male probably lost, locality FRENCH CAMEROONS : Kribi.

Genus *KRIBIOMYIA* Kieffer

Kribiomyia Kieffer, 1921, *Ann. Soc. sci. Brux.* **40** (1) : 271 ; Kieffer, 1921, *Ann. Soc. ent. France*, **90** : 30 and **91** : 18.

As with *Kribioxenus* I have seen no specimens that agree with the brief diagnosis given in Kieffer's keys. The genus was based on a plain-winged female which had broken antennae and which was separated from other genera mainly because the anterior tibia had a rounded scale which lacked a spur, the posterior tibia had a single spur, pulvilli were present and the wings unmarked. It could easily have been the female of a species of *Polypedilum* with broken front tibial spur, but with the inadequate diagnosis I prefer to treat it as *genus incertae sedis*.

Type species *Kribiomyia longipalpis* Kieffer by monotypy.

Kribiomyia longipalpis Kieffer

Kribiomyia longipalpis Kieffer, 1921, *Ann. Soc. ent. France,* **91** : 18.

The only known specimen was a female, whitish yellow in colour, 2·5 mm. long. The antennae were broken at the third segment ; wings plain, halteres white, legs yellow, tips of anterior tibiae and posterior tarsi a little obscured ; anterior femur nearly twice as long as tibia, anterior tarsi broken.

Holotype female probably lost, type locality FRENCH CAMEROONS : Kribi.

TRIBE TANYTARSINI

As explained in Part III, the Tanytarsini contains all the species of the Chironominae with not only macrotrichia on the wing membrane but also a bare squama and cross-vein parallel to and practically continuous with R_{4+5}. In addition the male hypopygium has accessory appendages associated with appendages 1 or 2 or with both.

The genus *Tanytarsus* was used by van der Wulp for a number of species, two of which were *punctipes* Weidemann and *signatus* Wulp, the identity of *signatus* being certain but that of *punctipes* being open to some doubt. Kieffer (1909, *Bull. Soc. Hist. nat. Metz,* **26** : 50) as first reviser, restricted *Tanytarsus* sensu stricto to species without pulvilli, which would include *signatus,* but he did not fix a type species. This was done by Coquillett (1910, *Proc. U.S. nat. Mus.* **37** : 612) who fixed *punctipes* as the type species. Unfortunately, *punctipes* as determined by Edwards and now generally accepted, possesses pulvilli and belongs to *Phaenopsectra,* a group placed in the Chironomini. Therefore, if the Rules of Nomenclature are followed, the name *Tanytarsus* should be used for *Phaenopsectra,* whilst the group previously called *Tanytarsus* should be called by the next available name which is *Calopsectra* Kieffer. This would involve a change of the name of the Tribe to Calopsectrini as has already been done by Townes (1945, *Amer. midl. Nat.* **34** : 11) who has been followed by some American Dipterists. Edwards, incorrectly, did not accept Coquillett's fixation on the grounds that it did not conform with Kieffer's restriction and in 1929 he proposed *signatus* as the type species.

The name *Tanytarsus* is now firmly entrenched in the literature and it is undesirable to change its meaning so drastically. I am, therefore, preparing a case for submission to the International Commission for Zoological Nomenclature asking that Coquillett's fixation should be set aside in favour of the later one by Edwards. For the time being I am continuing to use the name *Tanytarsus* in its usually accepted sense.

The species of the Tribe are all small or very small and difficult to distinguish from each other. Very few can be separated without examination of the male hypopygium which renders many of Kieffer's species quite unrecognizable.

Kieffer has described 23 species in the tribe from Africa south of the Sahara, two of which (*glabripennis* and *alticola*) belong to the Chironomini, genus *Polypedilum.* Of the remainder, 13 are based on females alone and cannot be recognized, whilst of the last eight only four have descriptions sufficient for their recognition. Short notes are given on the unrecognized species at the end of the Tribe.

Goetghebuer has described three species and I have described 11, all of which are redescribed and figured below.

KEY TO AFRICAN GENERA OF TRIBE TANYTARSINI

1. Combs of posterior tibia without spurs, large and overlapping, thus appearing to be fused (African species only) . . . . *Micropsectra* Kieffer
   Combs of posterior tibia small, well separated and usually both with spurs . . . 2
2. Eyes pubescent, small species with cuneiform wings . . . . . *Zavrelia* Kieffer
   Eyes bare 3
3. Both combs usually spurred ; wings not cuneiform ; R_{4+5} longer, ending beyond tip of M_{3+4} . . . . *Tanytarsus* Wulp
   One comb without spur ; wings cuneiform ; R_{4+5} shorter, ending at level of, or basal to, tip of M_{3+4} . . . . *Stempellina* Bause

Genus *MICROPSECTRA* Kieffer

Micropsectra Kieffer, 1909, *Bull. Soc. Hist. nat. Metz*, **26** : 50 ; Goetghebuer, 1938, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*) : 84.

Tanytarsus subg. *Micropsectra* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 407.

Male antennae 14-segmented, frontal tubercles absent ; combs of four posterior tibiae lacking spurs, fused in Palaearctic species but separate and overlapping in the single African species ; r-m cross-vein two or three times length of basal section of Rs.

The only known African species is represented by a single specimen from South Africa. It is not completely typical of the genus because of the condition of the combs which are so close that they overlap, a condition which I have not found in any of the Palaearctic species available to me. However, as in other ways the species falls into this genus I prefer to leave it there rather than erect a new genus.

Micropsectra capicola Freeman

Micropsectra capicola Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2** : 379.

Scutal stripes fused, shoulders yellowish, abdomen yellowish with dark bands, legs brown, combs unarmed but not fused, wings densely hairy, hypopygium with three appendages.

Male. Wing length 2·2 mm.

Head yellowish brown, frontal tubercles absent, pedicel brown, A.R. about 0·8. *Thorax* with yellowish ground colour, stripes dark brown and fused, scutellum, postnotum and sternopleuron brown, prescutellar area pale brown ; acrostichal bristles irregularly biserial, dorso-centrals uniserial. *Legs* brown and unmarked, anterior tibia two-thirds length of femur, tarsus missing ; posterior basitarsus two-thirds length of tibia, pulvilli absent, claws rather small ; combs unarmed, occupying about three-quarters of circumference of tibia, appearing fused at first sight but on closer inspection from the side they are seen to be separate but overlapping or touching. *Wings* densely clothed all over with macrotrichia, squama bare, r–m about three times length of base of Rs ; halteres yellow. *Abdomen* yellowish with brown bands at the incisures ; hypopygium (Text-fig. 10, *a*) with three appendages, *1a* absent, *2a* transverse and with simple hairs only.

Female not known.

Holotype male in collection of the Lund University Museum ; type locality CAPE PROVINCE : Hermanus Waterfall ; no other specimens known.

Genus *TANYTARSUS* van der Wulp

Tanytarsus van der Wulp, 1874, *Tijdschr. Ent.* **17** : 134 ; Goetghebuer, 1938, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*) : 105.

Tanytarsus subg. *Tanytarsus* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 409.

Combs of posterior tibiae at least narrowly separated ventrally, occupying at most half circumference of tibia, usually both with a spur but inner one often shorter and occasionally absent. Male antenna 13– or 14-segmented, of female 5–7–segmented. Wing membrane with a variable number of macrotrichia, R_{4+5} ending at level of, or more usually beyond tip of M_{3+4}, posterior fork usually well beyond cross-vein, tip of M_{3+4} often slightly sinuous, anal area always more or less developed. Scutellum usually with several long marginal bristles but in small species the central pair is the longest.

I am using *Tanytarsus* in a more restricted sense than it was used by Edwards, to include only those groups which he placed in his subgenus *Tanytarsus* ; I am treating most of his species groups as subgenera, a treatment which conforms with that of Goetghebuer. I have discussed the validity of the generic name above.

Tanytarsus used in this way includes most of the species of the tribe and can be recognized by the combs and tibial spurs, shape of wings and length of R_{4+5}. It can be divided into groups of species mainly on male genital characters, groups which have often been regarded previously as genera, but it is my opinion that they cannot be accorded a higher rank than subgenus because of the absence of similar characters in the female.

Separation of the species is not easy especially as they are subject to considerable variation particularly in colour ; the only reliable characters lie in the structure of the male genitalia, though here again there is variability. I am able to recognize 25 African species, falling into four subgenera but no doubt others will be found when there has been wider collecting of these tiny insects.

KEY TO SUBGENERA OF *Tanytarsus* FROM AFRICA SOUTH OF THE SAHARA

1. Pulvilli present ; male anal point with reflexed appendages in both the known African species . . . . *Calopsectra* Kieffer
   Pulvilli absent ; reflexed appendages absent 2
2. Appendage *2a* of the male hypopygium with branched hairs, styles rather short *Cladotanytarsus* Kieffer
   Appendage *2a* with hairs simple or flattened 3
3. R_1 and R_{4+5} close together and obliterating R_{2+3} ; male styles contracted at apex or for apical half . . . . *Rheotanytarsus* Bause
   R_{2+3} present, styles evenly pointed or rounded at apex . . *Tanytarsus* v. d. Wulp

Tanytarsus VAN DER WULP SUBGENUS *Tanytarsus* SENSU STRICTO

Tanytarsus van der Wulp, 1874, *Tijdschr. Ent.* **17** : 134.
Tanytarsus subg. *Tanytarsus* Group D, Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 413.
Tanytarsus subgenus *Tanytarsus* Goetghebuer, 1938, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*) : 105 ; Brundin, 1947, *Arkiv. Zool.* **39**A no. 3 : 67.

This subgenus includes all the species of the genus without special characters enabling them to be split off as separate groups ; most of the species fall here. Pulvilli absent or indistinct, frontal tubercles usually present, male styles not sharply contracted at apex, appendage 2*a* with simple, unbranched hairs. There are two species groups, those with simple anal point and those with a longitudinal row of dots placed between keels.

KEY TO AFRICAN SPECIES OF *Tanytarsus* S. STR., BASED ON MALE CHARACTERS

1.	Anal point of male simple	2
	Anal point of male with longitudinal row of dots as in Text-fig. 11	9
2.	Legs yellow with black tips to femora and to tibiae and tarsal segments ; abdomen yellow with distinctive black bands and longitudinal markings	*balteatus* Freeman
	Legs unmarked or only apices of femora vaguely darkened	3
3.	Appendage 1*a* absent	4
	Appendage 1*a* present	6
4.	Appendage 2*a* short and rounded (Text-figs. 10, *c*, *d*)	5
	Appendage 2*a* elongate (Text-fig. 10, *e*)	*angustus* Freeman
5.	Abdomen plain green	*pallidulus* Freeman
	Abdomen with broad dark bands on segments 2, 3, 6 and 8	*atrocinctus* Goetgbenuer
6.	Wings with macrotrichia over most of surface	*pallidissimus* Kieffer
	Matrotrichia reduced, present only at apex and sometimes as lines along centre of some cells	7
7.	Anal point bifid (Text-fig. 10, *g*)	*bifurcus* sp. n.
	Anal point simple	8
8.	Appendage 2*a* rounded (Text-fig. 10, *f*)	*nocticolor* Kieffer
	Appendage 2*a* elongate (Text-fig. 10, *h*)	*atomarius* Kieffer
9.	Body of male entirely black, frontal tubercles absent	10
	Body of male at least partially yellow or green	11
10.	Thorax dull, partially pruinose, hypopygium as in Text-fig. 11, *a*	*aterrimus* Freeman
	Thorax shining, without pruinosity, hypopygium as in Text-fig. 11, *b*	*luctuosus* sp. n.
11.	Thoracic markings brown	12
	Thoracic markings yellow	14
12.	Abdomen plain green, appendage 2*a* trifid (Text-fig. 11, *h*)	*trifidus* sp. n.
	Abdomen with dark markings	13
13.	Appendage 1 more or less square (Text-fig. 11, *d*), abdomen green with pale brown ring on each segment, tarsal beard absent	*spadiceonotatus* sp. n.
	Appendage 1 more elongate (Text-fig. 11, *c*), abdomen much darker and with a median longitudinal dark stripe, tarsal beard present	*nigrocinctus* Freeman
14	Abdominal segments each with a brown ring, male hypopygium as in Text-fig. 11, *e*, appendage 1 broad, 1*a* short, anal point broad	*mcmillani* sp. n.
	Abdomen quite plain	15
15.	Anal point narrow, styles curved (Text-fig. 11, *f*)	*flexistilus* sp. n.
	Anal point broader, styles straighter (Text-fig. 11, *g*)	*zariae* sp. n.

Tanytarsus (Tanytarsus) balteatus Freeman

Tanytarsus (*Tanytarsus*) *balteatus* Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83** : 36 ; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2** : 380.

Thorax pale with a broad vertical brown stripe on the pleura and brownish markings on the stripes ; legs yellow with black tips to femora, tibiae and tarsal segments, only one tibial spur ; abdomen yellow with distinctive black bands and longitudinal markings on segments 1–5 ; male hypopygium without row of dots on anal point, appendage 2*a* large and with fan-like arrangement of strong setae. The colour pattern makes this species easily determinable in both sexes.

Male. Wing length 1·75–2·0 mm.

Head yellowish brown ; face mouthparts and scape dark brown ; A.R. about 1·2, frontal tubercles present. *Thorax* with pale yellow pruinose ground colour, scutal stripes short, fused and pale brown but darker brown at posterior end of middle stripe and anterior ends of lateral stripes giving a cross-banded appearance ; this cross band is continued down each pleuron and on to the sternopleuron ; postnotum brown, darker at the apex. *Legs* yellow, apices of all femora and of tibiae broadly black, apices of tarsal segments also dark ; L.R. 2·2, pulvilli absent, combs well separated, only the outer one with a spur. *Wings* with macrotrichia on apical half, R_{4+5} ending beyond M_{4+5} ; halteres whitish. *Abdomen* yellow with black markings on segments 1, 2, 3, 5, 6 ; segments 1–3 with a median longitudinal black band which expands laterally to form a transverse band near the posterior margin, margin itself pale ; there is a short longitudinal pale line placed posteriorly in each black marking ; segment 5 with a similar black marking not so well developed, segment 6 all black. Hypopygium (Text-fig. 10, *b*) with short anal point lacking row of dots, appendage 1 more or less square, 1*a* rather stout, 2*a* large and with a fan-like arrangement of strong setae, styles narrow.

Female with markings as in male, macrotrichia more numerous on wing membrane, antennae with 6 segments, although the last 2 are indistinctly separated.

Holotype male in the British Museum.

DISTRIBUTION. SUDAN : holotype and paratypes, Adok ; other paratypes and further material, Melut and Shambe (*E. T. M. Reid*). NIGERIA : 11 ♂, 1 ♀, Kankiya, xii.1956–i.1957, 1 ♂, Kaduna, x.1956 and 1 ♂, Katsina, x.1956 (*B. McMillan*). UGANDA : 4 ♂, 5 ♀, Jinja, ix–x.1954 (*P. S. Corbet*). BELGIAN CONGO : paratypes from Parc National Albert. S. RHODESIA : 1 ♀, Salisbury, v.1956 (*E. T. M. Reid*). S. W. AFRICA : 6 ♂, 23 ♀, Kaokoveld (*P. Brinck*).

Tanytarsus (Tanytarsus) pallidulus Freeman

Tanytarsus (*Tanytarsus*) *pallidulus* Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 24 ; Freeman, 1955, *Explor. Parc Nat. Albert*, Miss de Witte, fasc. **83** : 35 ; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2** : 380.

Pale green with yellowish scutal stripes, frontal tubercles present, both tibial combs spurred, macrotrichia present over most of wing surface, appendage 2*a* of male hypopygium short and with simple hairs ; most easily separated from other green species by the male hypopygium.

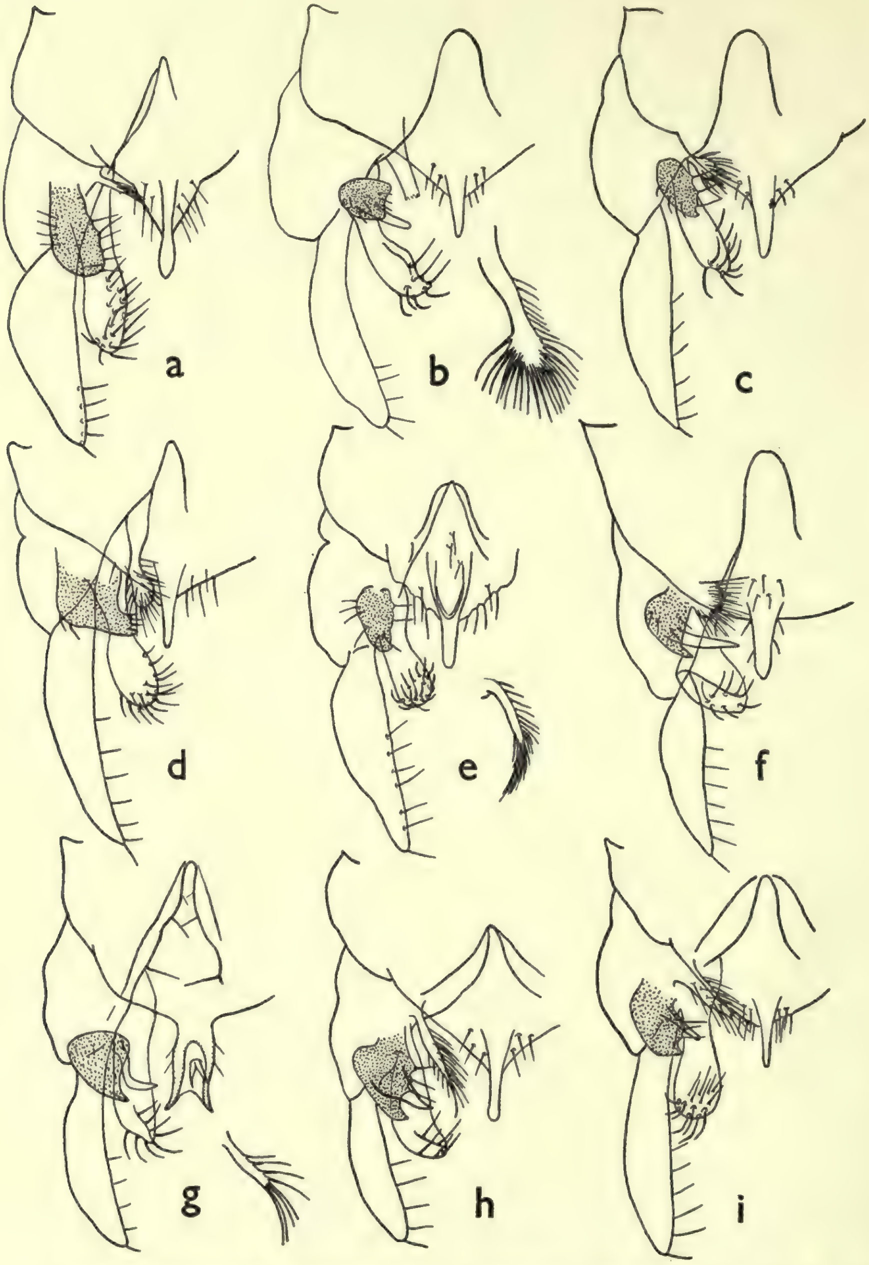

FIG. 10. Male hypopygia of *Micropsectra* and *Tanytarsus (Tanytarsus)*. *(a) M. capicola ; (b) T. balteatus* with appendage 2*a* drawn separately ; *(c) T. pallidulus ; (d) T. atrocinctus ; (e) T. angustus ; (f) T. nocticolor ; (g) T. bifurcus ; (h) T. atomarius ; (i) T. pallidissimus.*

Male. Wing length 2–2·5 mm.

Head and mouthparts yellowish green, antennae brown, pedicel reddish yellow, A.R. about 1·4, frontal tubercles present. *Thorax* pale yellowish green, scutal stripes, postnotum, sternopleuron yellow. *Legs* pale, L.R. 3, tibial combs well separated, each with a spur, that on outer comb the longer. *Wings* with macrotrichia over most of surface, bare tracts along some veins in basal half; halteres greenish. *Abdomen* green; hypopygium (Text-fig. 10, *c*) with well-defined anal point lacking row of dots, styles pointed and slightly curved; appendage 1 fairly broad, 1*a* absent, 2*a* short and rounded, clothed with simple hairs.

Female similar to male in colour; antennae with 6 segments, wings more uniformly clothed with macrotrichia.

Holotype male in the British Museum.

DISTRIBUTION. CAPE PROVINCE: holotype, Kirstenbosch; 2 ♀, 4 ♀, Stellenbosch and Tulbagh Barrage (*K. M. F. Scott*); 3 ♂, Ceres, iii.1925 (*R. E. Turner*). TRANSVAAL: 4 ♂, 1 ♀, Johannesburg, viii.1954, 1 ♂, Lydenburg, ix.1954 and 1 ♂, Magoebaskloof, iv–v.1955 (*A. D. Harrison*). BELGIAN CONGO: Parc National Albert. NIGERIA: 2 ♂, Kankiya, xii.1956–i.1957 (*B. McMillan*).

Tanytarsus (Tanytarsus) atrocinctus Goetghebuer

Tanytarsus atrocinctus Goetghebuer, 1936, *Rev. Zool. Bot. Afr.* **28**: 490.

Yellowish, abdomen with broad dark bands on segments 2, 3, 6 and 8 which distinguishes it from other species; wings evenly clothed with macrotrichia, male hypopygium not unlike *pallidulus* but appendage 1 much bigger. A.R. only 0·6.

Male. Wing length 1·3 mm.

Head, mouthparts and pedicel yellow, flagellum brown, A.R. 0·6, frontal tubercles probably absent. *Thorax* yellowish; stripes, postnotum and sternopleuron reddish. *Legs* uniformly pale, L.R. 2·5, both combs of posterior tarsus with spurs. *Wings* uniformly clothed with macrotrichia, halteres black-tipped. *Abdomen* with segment 1 greenish yellow, 2 and 3 each with a broad brown band leaving only incisures yellowish, 4 and 5 yellowish, 6 brown, 7 paler but brown basally, 8 brown. Hypopygium (Text-fig. 10, *d* of holotype) not unlike *pallidulus* but appendage 1 much bigger; 1*a* absent, 2*a* rounded, anal point well formed and without dots.

Female not known.

I have seen the holotype male which is in the Musée Royal du Congo Belge, Tervuren.

DISTRIBUTION. Known only from the type and paratype, BELGIAN CONGO: Rutshuru.

Tanytarsus (Tanytarsus) angustus Freeman

Tanytarsus (*Tanytarsus*) *angustus* Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83**: 35.

Greenish with yellow thorax; A.R. 1·2, frontal tubercles absent. Very similar to *pallidulus*, distinguished by absence of frontal tubercles and by appendage 2*a* being elongate and not short and rounded.

Male. Wing length 1·8–2·0 mm.

Head yellow, antennae and mouthparts brownish; A.R. 1·2, frontal tubercles absent. *Thorax* yellow, scutal stripes hardly darker. *Legs* yellow, L.R. 2·2, combs separate and each with a spur. *Wings* clothed all over with macrotrichia, halteres pale. *Abdomen* pale green; hypopygium (Text-fig. 10, *e*) with well-developed anal point lacking row of dots, style pointed, appendage 1 similar to *pallidulus*, 1*a* absent, 2*a* long and with simple hairs.

Female resembles male, antennae 6 segmented, 5 and 6 indistinctly separated.

Holotype male in collection of Institut Royal des Sciences Naturelles de Belgique.

DISTRIBUTION. BELGIAN CONGO: holotype and paratypes Parc National Albert, Riv. Bishakishaki and Riv. Molindi; further series in spirit, Kivu, Luhanga, vi.1955 (*G. Marlier*).

Seven males (NIGERIA: Kankiya, xii.1956–i.1957, *B. McMillan*) are structurally indistinguishable but have dark markings on the thorax, dark bands at apices of abdominal segments and apices of femora dark; this may represent a variety or a distinct species.

Tanytarsus (Tanytarsus) nocticolor Kieffer

Tanytarsus nocticolor Kieffer, 1911, *Rec. Ind. Mus.* **6**: 171.

Frontal tubercles present, thorax yellow with brown stripes, legs unmarked, both combs spurred, abdomen green, wings with reduced macrotrichia; hypopygium with appendage 1 beaked, 2*a* squat and with bushy hairs. The reduced macrotrichia and presence of appendage 1*a* are sufficient to distinguish this species from *pallidulus* and *atrocinctus* which are the only other species with rounded appendage 2*a*.

Male. Wing length 1·5 mm.

Head yellowish, frontal tubercles present, A.R. about 1. *Thorax* yellowish; stripes, postnotum and sternopleuron brown. *Legs* yellowish, unmarked, L.R. 2·5, both combs spurred, that on outer comb being the stronger. *Wings* with R_{4+5} ending opposite tip of M_{3+4}, macrotrichia present only at extreme apices of cells R_5 and M_2 and as a single row along centre of apical two-thirds of former; halteres pale. *Abdomen* green; hypopygium (Text-fig. 10, *f*) with simple anal point, appendage 1 with a beak, 1*a* long, 2 rather short and broad, 2*a* short, squat and with a brush of simple hairs.

Female similar to male though thorax may be paler, but wings with macrotrichia at apex of fork cell, as a line in cell M_2 and around margin of anal cell in addition; antennae with 6 segments.

Holotype female is in the British Museum and can be recognized because of the reduction of the macrotrichia and by the brown scutal stripes.

DISTRIBUTION. EGYPT: holotype female, Suez Canal; 1 ♂, Assuan, i.1923 (*S. Hirst*). SUDAN: 14 ♂, 8 ♀, Khartoum, 1–ii.1923 (*S. Hirst*); 14 ♂, 15 ♀, Wad Medani, ii.1952 (*D. J. Lewis*). BELGIAN CONGO: 1 ♂, Kasenyi (Lac Albert), xii.1953 (*J. Verbeke*).

Tanytarsus (Tanytarsus) bifurcus sp. n.

A small yellow and green species with darker thoracic stripes ; A.R. 0·6, frontal tubercles present, wing macrotrichia reduced, tibial combs with two spurs. Easily distinguished from *nocticolor* and others by the highly characteristic forked anal point which carries two erect lobes between the arms of the fork.

Male. Wing length 1·0 mm.

Head yellowish, pedicel brown, frontal tubercles present, A.R. 0·6. *Thorax* yellowish, stripes and postnotum brown, scutellum with two long marginal setae close together and a shorter one laterally. *Legs* whitish, L.R. 2·5, combs each with a spur, that on outer one the longer. *Wings* nearly cuneiform, R_{4+5} ending beyond level of apex of M_{3+4}, macrotrichia present at apices of cells R_5, M_2 and fork cell and as lines down centre of each cell and along margin of anal cell ; halteres white. *Abdomen* green ; hypopygium (Text-fig. 10, *g*) with peculiar anal point ; main body of point broad, thickened each side, emarginate at apex and appearing forked ; between the thickened margins are two erect pointed lobes ; appendage 1 more or less triangular and beaked, 1*a* sinuous and well formed, 2*a* with simple hairs.

Female not known.

Holotype male and 4 ♂ paratypes FRENCH WEST AFRICA, Haute Volta : Tangrela (Cercle de Banfora), xii.1956 (*J. Hamon*). Holotype and two paratypes returned to Office de la Recherche Scientifique Outre-Mer, two paratypes in the British Museum.

Tanytarsus (Tanytarsus) atomarius Kieffer

Tanytarsus atomarius Kieffer, 1918, *Ann. Mus. nat. Hung.* **16** : 72.
? *Tanytarsus pallidissimus* Kieffer, 1911, *Proc. Linn. Soc. Lond. Zool.* **14** : 358 (in part).

A tiny green species with yellow thoracic stripes, A.R. 0·5, frontal tubercles present, apex of R_{4+5} opposite tip of M_{3+4}, macrotrichia greatly reduced, combs both spurred, hypopygium with all appendages well developed. Although Kieffer described *atomarius* from a female, the small size, reduced macrotrichia, short radius and green colour make if fairly certain that I have identified the species correctly. As explained under *pallidissimus* the type series of that species is mixed, half being very similar to but with wings slightly more hairy than typical *atomarius*.

Male. Wing length 0·8–1·0 mm.

Head greenish yellow, pedicel brown, A.R. 0·5, frontal tubercles present. *Thorax* green with yellow stripes, postnotum and sternopleuron. *Legs* yellow, L.R. 2·5, each comb of posterior tibia with a spur. *Wings* narrow but not cuneiform, R_{4+5} ending opposite tip of M_{3+4}, posterior fork well distal to cross-vein, macrotrichia reduced in Transvaal specimens to a small group at extreme apex and a row along centre of distal half of cell R_5 ; Seychelles material has an additional group and row in cell M_2 and in fork cell. Halteres green. *Abdomen* green ; hypopygium (Text-fig. 10, *h*) with narrow and simple anal point, wide appendage 1 and 1*a*, 2 with only 5–6 hairs at tip, 2*a* with simple hairs.

Female. In the holotype and Seychelles specimens the thoracic markings are yellow but in the Transvaal specimens they are brown ; antennae with 5 segments, macrotrichia more abundant than in male, present at apices of cells R_5, M_2 and fork cells and as lines along the centres of these cells and around margin of anal cell.

I have seen the holotype female of *atomarius* which was in the Hungarian National Museum.

DISTRIBUTION. TRANSVAAL : holotype, Pretoria ; 2 ♂, Pongola River Settlements and 1 ♀, Great Usutu River, near Amsterdam, ix.1954 (*A. D. Harrison*). SEYCHELLES : 3 ♂, 3 ♀, cotypes of *pallidissimus*, Mahé, probably belong here.

Tanytarsus (Tanytarsus) pallidissimus Kieffer

Tanytarsus pallidissimus Kieffer, 1911, *Trans. Linn. Soc. Lond. Zool.* **14** : 358.

A pale greenish insect with yellow thoracic markings ; A.R. 0·5, frontal tubercles present, L.R. 2·8, combs with two spurs ; wings fairly evenly clothed with macrotrichia, hypopygium with 1*a* present, 2*a* with simple hairs. The type series contained two species, the smaller of which appears to be *atomarius* (see above) with wings rather more hairy than usual.

Male. Wing length 1·3–1·4 mm.

Head and antennae yellow, A.R. 0·5, frontal tubercles present. *Thorax* green, stripes and postnotum yellow, scutellum with two long hairs placed close together near the centre. *Legs* pale yellowish, L.R. 2·8, each comb with a spur. *Wings* with macrotrichia fairly evenly arranged over most of the surface, R_{4+5} ending well beyond level of tip of M_{3+4}. *Abdomen* pale green ; hypopygium (Text-fig. 10, *i*) differs from *atomarius* by the narrower appendage 1*a* ; appendage 1 with less well developed apical beak in paratype, thus appearing nearly oval, 2 with numerous hairs, 2*a* straight and with simple hairs.

Female similar to male, antennae with 6 segments.

There are ten specimens of the type series in the British Museum all from SEYCHELLES : Mahé ; six are ? *atomarius*, of the remaining 2 ♂, 2 ♀, I have marked one male as lectotype. No further material is known.

Tanytarsus (Tanytarsus) aterrimus Freeman

Tanytarsus (*Tanytarsus*) *aterrimus* Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 179 ; Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2** : 380.

A fairly large species, body of male entirely black, halteres and legs paler, female paler with separate thoracic stripes ; frontal tubercles absent, anal point with row of dots, appendage 1*a* present, 2*a* bent ; wing hairs moderately dense. Distinguished from *luctuosus*, the only other African black species known to me, by the pale halteres, pruinose hair lines and structure of male hypopygium.

Male. Wing length 2–2·5 mm.

Head, mouthparts and antennae very dark brown, pedicel black, A.R. 0·9, frontal tubercles absent. *Thorax* entirely black, dull and with black hair, lines of bristles pruinose. *Legs* brown, L.R. 2·0, front tarsus not bearded, combs each with a spur, the outer spur slightly the longer. *Wings* with macrotrichia in apical half, a line in basal cell and some in middle of anal cell, most veins in apical half with bare tracts alongside ; halteres pale or with a tinge of brown. *Abdomen* black ; hypopygium (Text-fig. 11, *a*) with irregular row of about 10 dots on anal point, appendage 1 oval and emarginate on inner margin, appendage 1*a* well formed, appendage 2*a* elbowed at the base and with a brush of simple hairs at the apex.

Female rather browner than male, thorax with paler background and more or less separate stripes, antennae with 5 segments the last 2 being fused ; wing hairs denser than in male and numerous in basal half especially in the anal cell.

Holotype male in the British Museum.

DISTRIBUTION. CAPE PROVINCE : holotype male and type series of both sexes, Berg River, Assegaibos, Driefontein and Tulbagh Barrage ; 1 ♂, 2 ♀, Ladismith (*P. Brinck*). TRANSVAAL : 3 ♂, Olifantsvlei nr. Johannesburg, viii.1954 and 2 ♂, 1 ♀, Magoebaskloof, iv–v.1955 (*A. D. Harrison*).

Tanytarsus (Tanytarsus) luctuosus sp. n.

Another entirely black species, at least in the male, distinguished from *aterrimus* by the slightly shining thorax which lacks pruinosity, by the black halteres and greatly developed appendage 2*a*.

Male. Wing length 1·4 mm.

Head, antennae and mouthparts black, A.R. 0·8, frontal tubercles absent. *Thorax* black with black bristles and slightly shining, hair lines without pruinosity. *Legs* dark brown, L.R. 2·0, pulvilli and tarsal beard absent, only the outer comb of posterior tibia with a spur. *Wings* with macrotrichia arranged much as in *aterrimus* halteres black. *Abdomen* black ; hypopygium (Text-fig. 11, *b*) with irregular double row of very small dots on anal point, appendage 1 narrow apically in holotype as shown, in the paratype with a small expansion near the tip, 1*a* absent, 2 rather small, 2*a* long and curved and with long curved hairs.

Female not known.

Holotype male, CAPE PROVINCE : Platteklip Gorge, i.1953 (*K. M. F. Scott*) ; paratype 1 ♂, TRANSVAAL : Magoebaskloof, nr. Tzaneen, v.1955 (*A. D. Harrison*). Both specimens are in the British Museum.

Tanytarsus (Tanytarsus) nigrocinctus Freeman

Tanytarsus (*Tanytarsus*) *nigrocinctus* Freeman, 1957, *Explor. Hydrobiol. Kivu, Ed. Albert.* Bruxelles, **3** : 220.

Yellowish, thoracic stripes dark brown, abdomen with dark rings and a median dark stripe ; legs pale without distinct markings ; frontal tubercles present, anterior tarsi with a slight beard. Distinguished from other species by the generally dark appearance, though not totally black as in males of *aterrimus* and *luctuosus*, as well as by details of the male hypopygium.

Male. Wing length 1·6–2·0 mm.

Head yellowish, mouthparts and antennae brown, frontal tubercles well developed, A.R. 2·0. *Thorax* yellowish with brown markings on the stripes, especially on the lateral ones, on the sternopleuron and postnotum. *Legs* yellow, L.R. 2·5, anterior tarsi with a scanty beard, combs well separated, each with a spur. *Wings* with macrotrichia at apices of cells R_5, M_2 and M_4 and as single rows in cells R_5 and M_2; halteres whitish. *Abdomen* greenish or brownish yellow with apical third of segments 2–7 black, segments 1 and 8 wholly black, 2–7 with a dark longitudinal stripe in addition to the apical bands. Hypopygium (Text-fig. 11, *c*) with a row of about 5–6 large dots on anal point, appendage 1 narrow, 1*a* short, 2*a* fairly small and with a brush of simple hairs at apex.

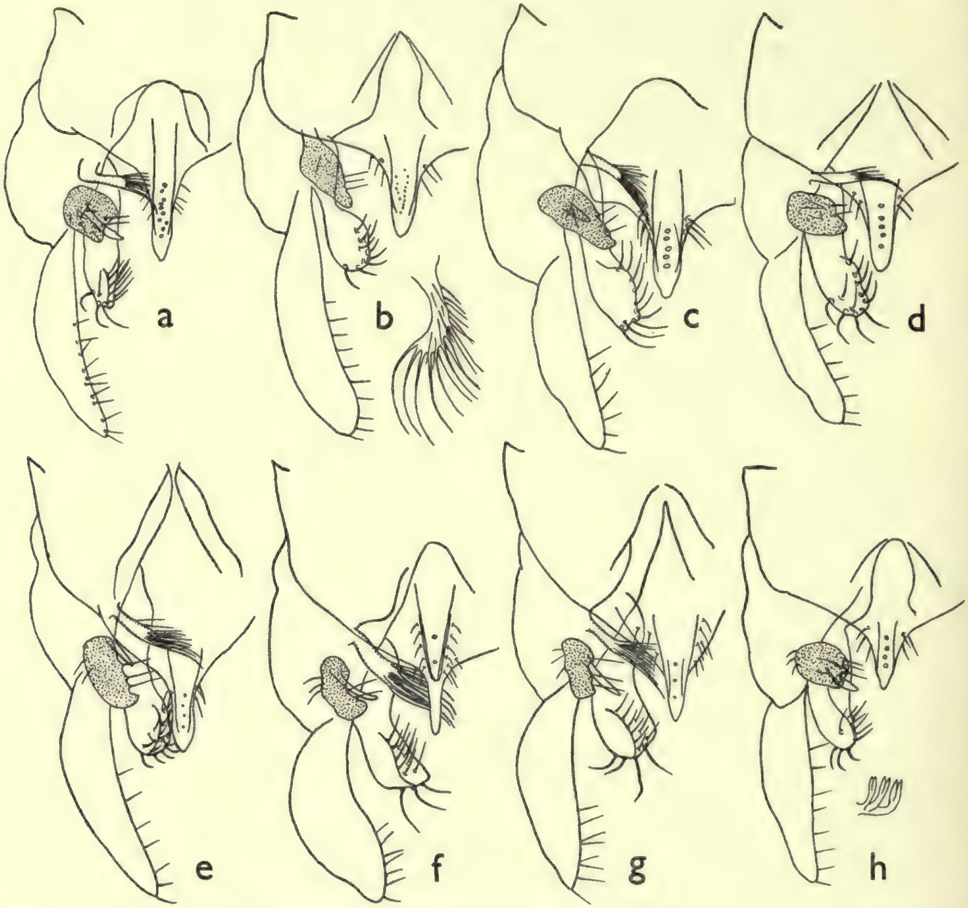

FIG. 11. Male hypopygia of *Tanytarsus (Tanytarsus)*. *(a) T. aterrimus*; *(b) T. luctuosus* with appendage 2*a* drawn separately; *(c) T. nigrocinctus*; *(d) T. spadiceonotatus*; *(e) T. mcmillani*; *(f) T. flexistilus*; *(g) T. zariae*; *(h) T. trifidus* with appendage 2*a* drawn separately.

Female very similar to male ; abdomen more evenly dark but with yellow markings showing in some specimens ; wings with macrotrichia more evenly distributed.

Holotype male in the British Museum.

DISTRIBUTION. SUDAN : 4 ♂, Rumbek, vi–vii. 1954 (*E. T. M. Reid*). NIGERIA : 12 ♂, Kankiya, xii. 1956–i. 1957 (*B. McMillan*). FRENCH WEST AFRICA, Haute Volta : 1 ♂, nr. Bobo Dioulasso, 1. 1957 (*J. Hamon*). UGANDA : holotype male and paratype, Lake Victoria. KENYA : paratypes, Kitui. BELGIAN CONGO : paratypes, Lake Kivu.

Tanytarsus (Tanytarsus) spadiceonotatus sp. n.

Green with brown thoracic and abdominal markings, A.R. 1·2, L.R. 2, both combs with spurs, macrotrichia reduced. Easily distinguished from *aterrimus* and *nigrocinctus* which have a somewhat similar hypopygium, by the smaller size and different colour.

Male. Wing length 1·5 mm.

Head yellow, mouthparts and antennae brown, A.R. 1·2, frontal tubercles present but small. *Thorax* yellowish green, postnotum, sternopleuron and stripes, especially lateral ones, brown. *Legs* yellowish, apices of femora obscurely darkened, pulvilli and tarsal beard absent, L.R. 2, each tibial comb with a spur. *Wings* with a few macrotrichia at extreme apices of cells R_5 and M_2 and as a single line half-way along former ; halteres green. *Abdomen* yellowish green or green, each segment with a pale brown ring on apical quarter or third, darker centrally and sometimes appearing as a row of spots. Hypopygium (Text-fig. 11, *d*) not unlike *nigrocinctus* but appendage 1 squarer ; anal point with a well-formed row of dots, appendage 1*a* very short, 2*a* with a brush at apex.

Female resembles male in colour and pattern, macrotrichia evenly distributed over apical half of wing and as a row in basal cell and around margin of anal cell ; antennae with 6 segments.

Holotype male and 15 ♂, 2 ♀ paratypes NIGERIA : Kankiya, xii. 1956–i. 1957 (*B. McMillan*) ; 1 ♀ paratype, Bauchi Prov., Vom, iii. 1957 (*W. A. McDonald*). S. RHODESIA : 3 ♂ paratypes, Salisbury, iv. 1956 (*E. T. M. Reid*).

Tanytarsus (Tanytarsus) mcmillani sp. n.

Pale yellow and green, scutal stripes yellowish red, abdominal segments each with a dark band posteriorly and indications of a central median stripe ; legs pale, no tarsal beard ; macrotrichia evenly distributed ; male hypopygium not unlike *nigrocinctus* but dots on anal point smaller and appendage 1 broader. This species is very similar to *nigrocinctus* in structure but can be distinguished by its much paler colour, absence of tarsal beard, denser wing macrotrichia and male hypopygial details.

Male. Wing length 1·8–2·0 mm.

Head yellow, mouthparts and antennae pale brown, A.R. 1·8, frontal tubercles present. *Thorax* pale yellow with yellowish red stripes and sternopleuron, the postnotum is brown. *Legs* pale, apices of femora and tibiae faintly darker, L.R. 3 or over, tarsal beard absent, each comb of posterior tibia with a well-formed spur. *Wings* with moderately dense macrotrichia over most of surface, basal quarter bare, halteres pale. *Abdomen* green, each segment with posterior quarter or third dark; on segments 2–5 this band tends to be extended forwards forming a partial median dark line. Hypopygium (Text-fig. 11, *e*) not unlike *nigrocinctus*; anal point with row of about four dots but these are smaller than in *nigrocinctus*, appendage 1 broader, 1*a* short, 2*a* rather similar in the two species.

Females taken at the same time as the males show a general resemblance but lack the dark abdominal markings.

Holotype male and 19 male paratypes NIGERIA: Kankiya, xii.1956–i.1957 (*B. McMillan*); further paratypes, 2 ♂, Kaduna, x.1956 and 1 ♂, Zaria, xi.1956 (*B. McMillan*). I am not making the females paratypes as there is some doubt over their identity; all specimens are in the British Museum.

Tanytarsus (Tanytarsus) flexistilus sp. n.

Very similar to *mcmillani*, differing in colour only in the abdomen which lacks dark markings and is plain green. Structurally, the two species can be separated only by the male hypopygium which in the present species (Text-fig. 11, *f*) has a narrower anal point of different appearance with the dots reduced to about 2–3, appendage 1 concave inwardly, 1*a* longer, 2*a* rather larger than *mcmillani*, styles stout and curved. Female not known. This is possibly a well-marked colour variation of *mcmillani*—see also the next species.

Holotype male and paratypes 2 ♂, NIGERIA: Kankiya, xii.1956–i.1957 (*B. McMillan*) in the British Museum. Further paratypes 2 ♂, FRENCH WEST AFRICA, Haute Volta: Sosogona, nr. Bobo Dioulasso i.1957 (*J. Hamon*) returned to Office de la Recherche Scientifique Outre-Mer.

Tanytarsus (Tanytarsus) zariae sp. n.

This is another species resembling *mcmillani* in structure but differing in the plain green abdomen; it is smaller and paler than either *mcmillani* or *flexistilus* the anal point is more like that of the former but appendages 1 and 1*a* are more like those of the latter. It may also be a variety of *mcmillani*.

Male. Wing length 1·5 mm.

Head mouthparts and antennae including pedicel yellowish white frontal tubercles present, A.R. 1·2. *Thorax* yellowish white, stripes barely indicated, these and postnotum yellowish. *Legs* pale greenish white, pulvilli and tarsal beard absent, L.R. 3, each comb with a spur. *Wings* fairly evenly clothed with macrotrichia except for basal quarter, halteres greenish. *Abdomen* pale green; hypopygium (Text-fig. 11, *g*) very similar to *mcmillani* but appendage 1 of more irregular shape, 1*a* longer, styles wider.

Female not known.

Holotype male and 4 ♂ paratypes, NIGERIA: Zaria, xi.1956 (*B. McMillan*);

1 ♂ paratype, Kankiya, x.1956 (*B. McMillan*). GOLD COAST: 1 ♂ paratype, Nangodi, x.1954 (*G. Crisp*). All specimens are in the British Museum.

Tanytarsus (Tanytarsus) trifidus sp. n.

Thoracic markings brown, abdomen plain green, frontal tubercles probably absent, L.R. 3, macrotrichia dense at apex, sparser elsewhere; most easily distinguished from species with somewhat similar colouring such as *spadiceonotatus* by the peculiar appendage *2a* which is in three branches, each bifid and pointing anteriorly instead of posteriorly.

Male. Wing length 1·0–1·4 mm.

Head and mouthparts yellowish, antennae darker, A.R. 1, frontal tubercles cannot be seen and are probably absent. *Thorax* yellowish green with stripes and postnotum brown. *Legs* very pale and without markings; L.R. 3, pulvilli and tarsal beard absent, both combs of posterior tibia with spurs. *Wings* with R_{4+5} ending at level of apex of M_{3+4}, macrotrichia dense at apex, but sparser and confined to tracts along centre of cells more basally, halteres green. *Abdomen* pale green or whitish, without dark markings. Hypopygium (Text-fig. 11, *h*) with row of about four large dots on anal point; appendage 1 subovoid, sometimes with inner margin slightly produced, *1a* sinuous, well developed, *2a* quite characteristic, pointing anteriorly and formed of three bifid branches which are sometimes folded up and difficult to distinguish from each other.

Female not known.

Holotype male and 15 ♂ paratypes, NIGERIA: Kankiya, xii.1956–i.1957 and 1 ♂ paratype, Zaria, xi.1956 (*B. McMillan*) all in the British Museum. Further paratype 1 ♂, FRENCH WEST AFRICA, Haute Volta: Banouaradougou, nr. Bobo Dioulasso, ix.1956 (*J. Hamon*) returned to Office de la Recherche Scientifique Outre-Mer.

Tanytarsus VAN DER WULP SUBGENUS ***Calopsectra*** KIEFFER

Calopsectra Kieffer, 1909, *Bull. Soc. Hist. nat. Metz*, **26**: 50.
Tanytarsus subg. *Tanytarsus* Group B Edwards, 1929, *Trans. ent. Soc. Lond.* **77**: 411.
Tanytarsus subg. *Calopsectra* Goetghebuer, 1938, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*): 127; Brundin, 1947, *Arkiv Zool.* **39A** no. 3: 66 (mis-spelt *Calospectra*).

This subgenus is separated from the others by the presence of well-developed pulvilli. In the two African species and in two Palaearctic species the anal point of the male carries a pair of reflexed appendages which are hinged either near the tip or at the base of the anal point and lie between two narrow ridges or flaps on the IXth tergite. *T.* (*C.*) *subreflexens* Freeman is only doubtfully distinct from the Palaearctic species *richmondensis* Edwards.

KEY TO AFRICAN SPECIES OF *Tanytarsus* SUBG. *Calopsectra*

Abdomen quite unmarked, anal point of male long, its appendages hinged near its apex (Text-figs. 12, *a*, *b*) . . . . *subreflexens* Freeman
Abdomen with dark rings or mainly dark, anal point short, its appendages hinged near its base (Text-figs. 12, *d*, *e*) . . . . . . *nigricornis* Goetghebuer

Tanytarsus (Calopsectra) subreflexens Freeman

Tanytarsus (*Calopsectra*) *subreflexens* Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83** : 37.

A yellowish green species, structurally very similar to the Palaearctic species *reflexens* and *richmondensis* Edwards. Pulvilli present, L.R. 3, anal point of male with reflexed appendages hinged near apex and fitting between two short ridges or flaps on the IXth tegite quite as in *richmondensis*. Separable from the following species by the pale colour and longer anal point. Whether this species is really distinct from *richmondensis* is open to some doubt, but as it is so pale, the leg ratio is greater and a name is available I have preferred to maintain the separation.

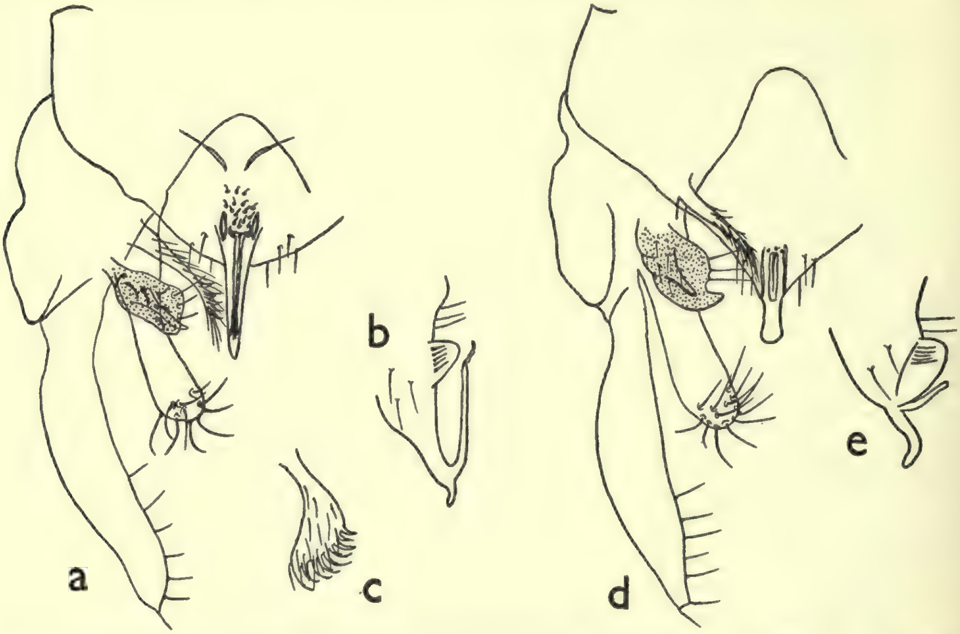

FIG. 12. Male hypopygia of *Tanytarsus (Calopsectra)*. *(a)–(c) C. subreflexens*. *(a)* In dorsal aspect ; *(b)* anal point in lateral aspect ; *(c)* appendage 2*a* in lateral aspect ; *(d)–(e) T. nigricornis*. *(d)* In dorsal aspect ; *(e)* anal point in lateral aspect.

Male. Wing length 1·5–2·5 mm.

Head yellowish, in some specimens slightly brownish, mouthparts and antennae may also be brown, frontal tubercles present, A.R. 1·3. *Thorax* yellow, scutal stripes hardly darker. *Legs* yellow, pulvilli present, L.R. 3, posterior tibial combs with two spurs, outer one long, inner one short. *Wings* covered all over with macrotrichia, halteres yellow. *Abdomen* pale green ; hypopygium (Text-figs. 12, *a–c*) indistinguishable from *richmondensis* ; anal point long and with a pair of reflexed appendages hinged nears its apex and fitting between a pair of short flaps between which are some short hairs ; appendage 1 rectangular in outline and hairy, sometimes slightly produced at the outer apex, *1a* hardly longer ; *2a* broad and with broad curved tooth-like hairs along margin, appendage is usually seen edge-on in dorsal view ; styles slightly sinuous at apex.

Female resembles male in colour, antennae with last 2 segments indistinctly separated.

Holotype male in Institut Royal des Sciences Naturelles de Belgique.

DISTRIBUTION. BELGIAN CONGO : type series from Lac Magera, Kamande, Vitshumbi (Parc Nat. Albert). NIGERIA : 13 ♂, Kankiya, xii.1956–i.1957 (*B. McMillan*). GOLD COAST : 1 ♂, 1 ♀, Nangodi, x.1954 (*G. Crisp*). ABYSSINIA : 1 ♂, 1 ♀, Waldia, ii.1936 (*J. W. S. Macfie*).

Tanytarsus (Calopsectra) nigricornis Goetghebuer

Tanytarsus nigricornis Goetghebuer, 1935, *Rev. Zool. Bot. Afr.* **26** : 398.

This is normally a darker species than *subreflexens*, and usually has brown thoracic markings and abdominal bands but pale specimens do occur ; L.R. 2·5, frontal tubercles present ; male hypopygium with short anal point, reflexed appendages shorter than in *nigricornis* and hinged nearer the base of the anal point, lobes between which they lie are longer. I have seen Goetghebuer's type and found it to be very pale but the male hypopygium is identical with that described here.

Male. Wing length 1·5–2·0 mm.

Head green, antennae and mouthparts brown or blackish, A.R. 1·75, frontal tubercles present. *Thorax* pale green ; stripes, postnotum and sternopleuron usually brown or blackish, reddish in pale specimens. *Legs* brown, pulvilli present, L.R. 2·5, spurs as in *subreflexens*. *Wings* with macrotrichia over most of the surface, halteres green. *Abdomen* in most specimens green with dark markings ; the apical half of each segment is usually brown but the brown colour may encroach on the green in the central line, even joining up with the dark on the segment in front, so that the green is reduced to lateral patches on each segment ; occasional specimens, including the holotype, have the abdomen entirely green. Hypopygium (Text-figs. 12, *d*, *e*) with shorter and more bent anal point than *subreflexens*, reflexed appendages hinged near the base of the point, flaps between which they lie are longer in this species and whole side aspect different ; appendage 1 with definite beak, though of variable shape, *1a* of variable length, *2a* as in *nigricornis*, style not sinuous at apex.

Female similar to male, abdominal bands present but less obvious, antennae with segments 5 and 6 indistinctly separated.

Holotype male in Musée Royal du Congo Belge.

DISTRIBUTION. BELGIAN CONGO : holotype male, Kamande. ABYSSINIA : 1 ♂, 2 ♀, Waldia, xii.1935 (*J. W. S. Macfie*). YEMEN : 5 ♂, San'a, xi.1937 (*C. Rathjens*). UGANDA : 11, ♂ 3 ♀, L. Victoria, vi.1950 (*W. W. Macdonald*). S. RHODESIA : 8 ♂, Salisbury, v.1956 (*E. T. M. Reid*). TRANSVAAL : 33 ♂, 15 ♀, Olifantsvlei nr. Johannesburg, ii–ix.1954 (*A. D. Harrison*) ; 6 ♂, Lydenburg District, Waterval, iv–v.1955 (*A. D. Harrison*). NATAL: 21 ♂, 1 ♀, Mooi River, 1 ♂, 1 ♀, Tugela River, 1 ♀, Bushman's River, ix.1953 (*A. D. Harrison*); 2 ♂, 1 ♀, Weenen, viii.1924 (*H. P. Thomasset*).

Tanytarsus VAN DER WULP SUBGENUS ***Rheotanytarsus*** BAUSE

Rheotanytarsus Bause, 1914, *Arch. Hydrobiol. Planktonk.*, Suppl. **2** (1) : 120.
Tanytarsus subg. *Tanytarsus* Group C Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 413.
Tanytarsus subg. *Rheotanytarsus* Goetghebuer, 1938, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*) : 132 ; Brundin, 1947, *Arkiv Zool.* **39**A no. 3 : 76.

This subgenus is mainly to be separated from the others by the sharp narrowing of the apex, sometimes of the apical third, of the male styles, although occasionally it is less marked than usual. In addition pulvilli and frontal tubercles are absent and R_{2+3} is obliterated by the close approximation of R_1 and R_{4+5}. The larvae of the European species *T. photophilus* Goetghebuer make tube-like cases and Dr. K. M. F. Scott tells me *in litt.* that *T. fuscus* makes similar cases in South Africa.

KEY TO AFRICAN SPECIES OF *Tanytarsus* SUBGENUS *Rheotanytarsus*

General colour pale yellowish green, A.R. 1, L.R. nearly 3, male styles (Text-fig. 13, *a*) sharply contracted for apical third and bent downwards at tips . . *guineensis* Kieffer

General colour of most specimens brown, A.R. 0·6, L.R. hardly 2, male styles (Text-fig. 13, *b*) much less sharply contracted and not for as much as apical third, nor bent down at tips . . . . *fuscus* Freeman

Tanytarsus (Rheotanytarsus) guineensis Kieffer

Rheotanytarsus guineensis Kieffer, 1918, *Ann. Mus. nat. Hung.* **16** : 73.

Yellowish green, thoracic stripes reddish; A.R. about 1, L.R. nearly 3, male styles strongly contracted for apical third and bent downwards at tips. Distinguished from *T. fuscus* as shown in the key.

Male. Wing length 1·8 mm.

Head, antennae and mouthparts yellow, A.R. about 1, frontal tubercles absent. *Thorax* yellowish green, stripes, postnotum and sternopleuron reddish. *Legs* yellowish, pulvilli and tarsal beard absent, L.R. 2·75. *Wings* with reduced anal lobe, fairly densely clothed all over with macrotrichia except on the basal quarter. *Abdomen* uniformly pale green; hypopygium (Text-fig. 13, *a*) with anal point of variable length, sometimes a little longer than figured, appendage 1 more or less oval, very similar to *fuscus*, appendage 1*a* absent, 2 rather clubbed, 2*a* hairy and with oval lamellae at the apex; styles highly characteristic, the narrow portion being long and bent downwards at the apex.

Female similar to the male, antennae with 6 segments.

The type series is lost, but the figure of the male hypopygium given by Kieffer makes identification certain. Type locality GUINÉE FRANÇAIS: Mamon.

DISTRIBUTION. UGANDA: 2 ♂, 1 ♀, L. Victoria (*W. W. Macdonald*). BELGIAN CONGO: 1 ♂, Rutshuru, i.1934 (*de Wulf*); 2 ♂, Elisabethville, xii.1938 (*H. J. Brédo*).

Tanytarsus (Rheotanytarsus) fuscus Freeman

Tanytarsus (*Rheotanytarsus*) *fuscus* Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 25 ; Freeman, 1955, *S. Afr. Animal Life.* Uppsala, **2** : 381.

Usually a brown species, although some specimens from S. Rhodesia are coloured like *guineensis* (see below), wings densely hairy ; A.R. 0·6, L.R. hardly 2, male styles slightly contracted at apex, anal point well formed but narrower than in *guineensis*. Distinguished from *guineensis* by its normally darker colour, lower A.R. and L.R. and by the much shorter apical narrow portion of the styles which is sometimes hardly apparent.

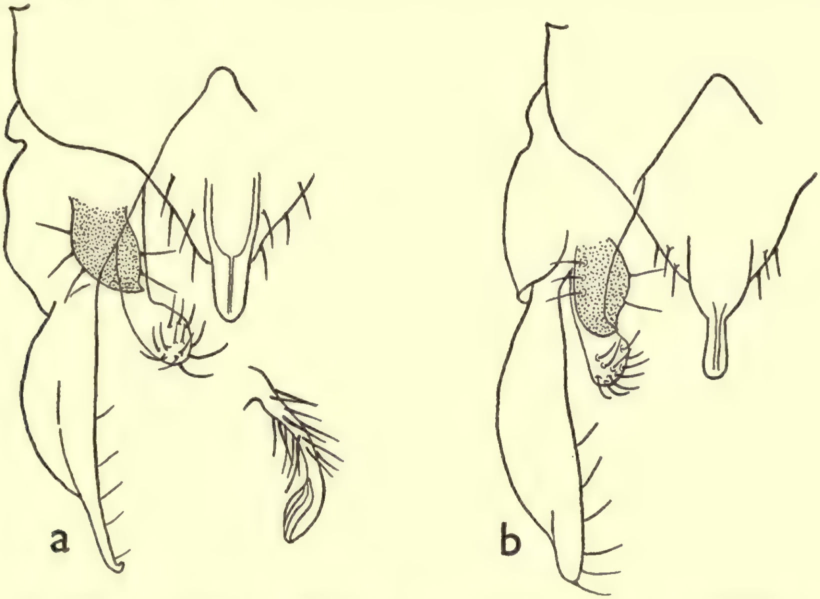

FIG. 13. Male hypopygia of *Tanytarsus (Rheotanytarsus)*. *(a) T. guineensis* with appendage 2*a* shown separately ; *(b) T. fuscus* with appendage 2*a* omitted.

Male. Wing length 1·5–2·0 mm.

Head, mouthparts and antennae brown ; A.R. 0·6, frontal tubercles absent. *Thorax* brown or yellowish brown ; stripes, postnotum and sternopleuron darker brown. *Legs* brown, L.R. 2 or slightly less, no tarsal beard. *Wings* with reduced anal lobe, thickly clothed over most of the surface with macrotrichia, halteres pale. *Abdomen* brown ; hypopygium (Text-fig. 13, *b*) with well-developed anal point which is narrower than in *guineensis* ; appendage 1 not dissimilar, 1*a* absent, 2*a* similar ; styles of most specimens contracted at apex as shown, but not turned down at tips, sometimes with the contraction less obvious.

Female similar to male, abdomen may be tinged with green, antennae with 6 segments.

Holotype male in the British Museum, type locality CAPE PROVINCE : Berg River, Wellington.

DISTRIBUTION. CAPE PROVINCE: type series and other specimens from Berg River at Wellington, Piquetberg and French Hoek, also from Wemmer River and Palmiet River. NATAL: 5 ♂, 1 ♀, Shooter's Hill, vii.1956 (*B. Stuckenberg*). UGANDA: 1 ♂, Mt. Elgon, Bulambuli, 9,500 ft., viii.1934 (*J. Ford*). ABYSSINIA: 1 ♂, 6 ♀, Waldia, i.1936 (*J. W. S. Macfie*). A series from RHODESIA (3 ♂, 2 ♀, Salisbury, v.1956, *E. T. M. Reid*) is coloured green with yellowish-red thoracic markings as in *guineensis*. Structurally, they are similar to other specimens of *fuscus* and I am treating them as a colour variety.

Tanytarsus VAN DER WULP SUBGENUS ***Cladotanytarsus*** KIEFFER

Cladotanytarsus Kieffer, 1922, *Ann. Soc. sci. Brux. Mém.* **42**: 100; Brundin, 1947, *Arkiv Zool.* **39**A no. 3: 78.
Tanytarsus subg. *Tanytarsus* Group F Edwards, 1929, *Trans. ent. Soc. Lond.* **77**: 418.
Tanytarsus subg. *Cladotanytarsus* Goetghebuer, 1938, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*): 133.

Very similar to *Tanytarsus* s. str., separated by the presence of branched hairs on appendage 2*a* of the male hypopygium; pulvilli absent, male styles short and not contracted at the tips. The five African species belonging to this group that I have been able to recognize, are not all easy to separate because there seems to be a good deal of intergrading. Although a large dark male of *capensis* at first sight appears very different from a small pale specimen of *reductus*, there are so many intergrading forms and varieties that the definition of each species becomes blurred.

T. fulvofasciatus Kieffer belongs here but it cannot be definitely assigned to any one species because the colour and pattern fit *lewisi*, whilst the male genital structure agrees better with *pseudomancus*.

KEY TO AFRICAN SPECIES OF *Tanytarsus* SUBGENUS *Cladotanytarsus*

1. Anterior tarsi of male with long beard, a large dark species (wing length 1·7–2·3 mm.) . . . *capensis* Freeman
   Tarsal beard absent 2
2. Abdomen with dark markings 3
   Abdomen plain and unmarked 4
3. Thoracic markings dark brown or blackish, appendage 1 smaller, 2*a* less bushy (Text-fig. 14, *a*) . . . . *pseudomancus* Goetghebuer
   Thoracic markings reddish, appendage 1 larger, 2*a* bushy (Text-fig. 14, *c*) . . . *lewisi* Freeman
4. Wing of male with macrotrichia on fork and anal veins, thoracic markings black, appendage 1 large (Text-fig. 14, *e*) . . . . *linearis* Freeman
   Wing veins of male lacking these macrotrichia, thoracic markings reddish or brown, appendage 1 small (Text-fig. 14, *d*) . . . . *reductus* Freeman

Tanytarsus (Cladotanytarsus) pseudomancus Goetghebuer

Tanytarsus pseudomancus Goetghebuer, 1934, *Rev. Zool. Bot. Afr.* **25**: 200.
Tanytarsus (*Cladotanytarsus*) *pseudomancus* Freeman, 1955, *Explor. Parc Nat. Albert*, Miss. de Witte, fasc. **83**: 38; Freeman, 1955, *S. Afr. Animal Life*. Uppsala, **2**: 381.

Thoracic stripes dark brown, wings with macrotrichia at apex, L.R. 2·5, abdomen whitish or pale green, each segment with a dark apical band, also darker along median line, anal point fairly broad and with numerous dots, appendage 1*a* sinuous. Apart from a dark form found in the Cape, this species can be distinguished from the others by the colour pattern of the abdomen; the shapes of appendages 1 and 1*a* are also distinctive.

The hypopygial structure is similar to that figured by Kieffer for *Cladotanytarsus fulvofasciatus* which also has dark rings on the abdomen, but the pale colour of the thorax of Kieffer's species is not like any that I have seen and I prefer not to synonymize the two, especially as Kieffer omitted the anal point in his figure.

Male. Wing length 1·3–1·5 mm.

Head and mouthparts brown, pedicel dark brown, A.R. 1·2, frontal tubercles not visible. *Thorax* with yellowish background; stripes, postnotum and sternopleuron dark brown or blackish. *Legs* unmarked, yellowish or brown, L.R. about 2·5 or slightly less, tarsal beard absent, pulvilli absent, posterior tibia with a spur on each comb. *Wings* with macrotrichia reduced to a small number at extreme apices of cells R_5 and M_2 and a short row down the centre of the apical half or less of cell R_5, veins of posterior fork and anal vein without macrotrichia. Halteres pale. *Abdomen* usually whitish or pale green or yellowish, segments 1–6 with an apical dark ring; abdomen also with an ill-defined central dark line, dividing pale area of each segment. Hypopygium (Text-fig. 14, *a*) with broad anal point marked with as many as 20 dots, appendage 1 narrow but well formed, 1*a* long and sinuous, 2*a* showing a good deal of subdivision but not as bushy as in *lewisi*.

Female. Such specimens as I have seen, have the macrotrichia more numerous in apical half of wing and around anal cell; all veins hairy, abdomen dark.

I have seen the type series of males in Musée Royal du Congo Belge, Tervuren.

DISTRIBUTION. EGYPT: 7 ♂, Darfur, El Fasher, iv.1920 (*H. Lynes*); 3 ♂, Aswan, i.1923 (*S. Hirst*). SUDAN: 15 ♂, Khartoum, i.1931 (*H. W. Bedford*); 18 ♂, Wad Medani, ii.1952 (*D. J. Lewis*). NIGERIA: 9 ♂, Kankiya, xii.1956–i.1957 (*B. McMillan*). GOLD COAST: 1 ♂, nr. Kumasi, x.1952 (*J. Bowden*). BELGIAN CONGO: type series and other specimens, Kivu; long series from Parc National Albert. TRANSVAAL: 3 ♂, Marble Hall, iv–v.1955 (*A. D. Harrison*). CAPE PROVINCE: 1 ♂, Berg River, Piquetberg, i.1953 (*K. M. F. Scott*). Some specimens from CAPE PROVINCE: Kirstenbosch, are structually very similar but have the abdomen much darker and the wings more hairy. They may suggest a link with *capensis*.

Tanytarsus (Cladotanytarsus) capensis Freeman

Tanytarsus (*Cladotanytarsus*) *capensis* Freeman, 1954, *Proc. R. ent. Soc. Lond* (B) **23**: 24.

This species is very similar to *pseudomancus* and may only be a dark variety of it. It is larger, with wing length 1·75–2·3 mm., and the colouring is darker, the abdomen being mainly very dark brown or blackish, although if a male is examined from behind the pale areas present on the abdomen of *pseudomancus* can just be distinguished. It is most easily distinguished by the well-developed long beard on the front tarsi of the male. Hypopygium (Text-fig. 14, *b*) quite similar to *pseudomancus* but the anal point is narrower, appendage 1 more strongly waisted and 1*a* less sinuous.

Holotype male in the British Museum.

DISTRIBUTION. Known only from CAPE PROVINCE: holotype and paratypes, Zeekoe Vlei; paratypes, Bergvliet and Piquetberg.

Tanytarsus (Cladotanytarsus) lewisi Freeman

Tanytarsus (*Cladotanytarsus*) *lewisi* Freeman, 1950, *Proc. R. ent. Soc. Lond.* (B) **19** : 58; Lewis, 1957, *Bull. ent. Res.* **48** : 155–184.

A pale green species, thoracic markings reddish, abdomen with dark bands, frontal tubercles present in the male, anal point narrow, appendage 1 large, 1*a* bent at apex, 2*a* large and bushy. The larger appendage 1 and the more bushy appendage 2*a* make this species comparatively easy to determine, they also suggest that this is not the species which Kieffer described as *fulvofasciatus* even though the colouring is similar.

Male. Wing length 1·5–1·75 mm.

Head yellowish green, frontal tubercles small but distinct, A.R. about 1. *Thorax* pale yellowish green, mesonotal stripes, postnotum and sternopleuron reddish. *Legs* pale green, tibiae may be darkened at apices, tarsal beard and pulvilli absent, combs of posterior tibia each with a spur, L.R. 2·25. *Wings* with macrotrichia on membrane at extreme apex, mostly in cell R_5, fork veins and anal vein bare; halteres pale. *Abdomen* green, each segment dark at apex giving a ringed appearance; hypopygium (Text-fig. 14, *c*) differs from other species by the larger appendage 1 and the more bushy and stouter 2*a*; 1*a* is bent at apex, anal point narrow and with a few dots basally, IXth tergite with a prominent central ridge which is indicated by two parallel lines in the figure.

Female differs from male in colour by the abdominal rings being dark green; wings with a few extra macrotrichia as lines down the centres of the cells, fork veins bare.

Holotype male in the British Museum.

DISTRIBUTION. Known only from SUDAN: Khartoum (type locality), Wad Medani and Wadi Halfa.

Lewis (1957) records this species as a great nuisance and as causing a form of asthma in Khartoum where it is extremely abundant; he gives some account of the biology and life history in the same paper.

Tanytarsus (Cladotanytarsus) reductus Freeman

Tanytarsus (*Cladotanytarsus*) *reductus* Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 180.

A small green species with reddish or brown thoracic markings and plain abdomen; macrotrichia reduced but present for about half length of vein M_1, tarsal beard absent; hypopygium with narrow anal point, small appendage 1 and straight 1*a*.

Male. Wing length 1·25–1·5 mm.

Head, mouthparts and antennae yellow or brown, small frontal tubercles visible in some specimens, A.R. about 0·75. *Thorax* yellow; stripes, postnotum and sternopleuron either reddish yellow or brown. *Legs* yellow or greenish, L.R. 2·4, beard and pulvilli absent, both combs of posterior tibia spurred. *Wings* with posterior fork rather more distal than usual, macrotrichia present at extreme apices of cells R_5 and M_2 and as lines down the centre of one or both cells, vein M_1 with macrotrichia for about half its length; halteres pale. *Abdomen* green and without

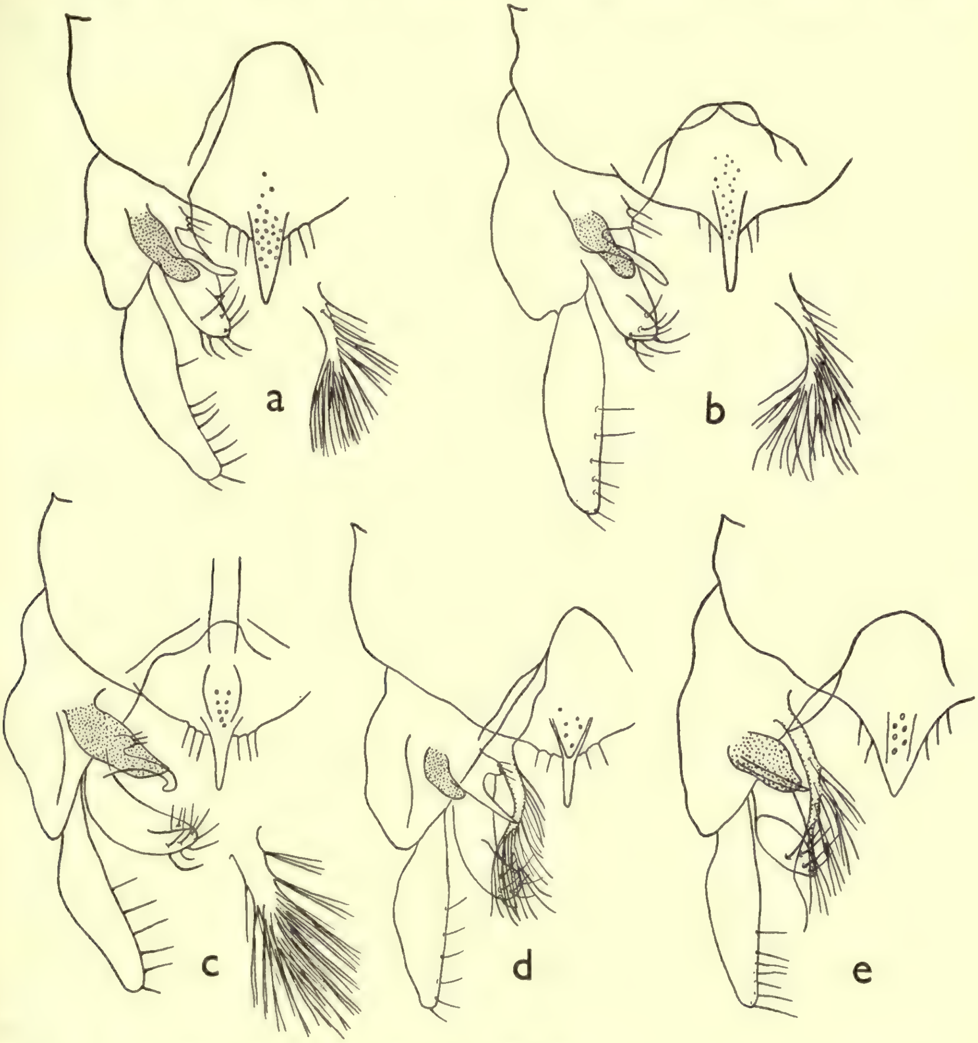

FIG. 14. Male hypopygia of *Tanytarsus (Cladotanytarsus)*. *(a) T. pseudomancus* with appendage 2*a* drawn separately; *(b) T. capensis* with appendage 2*a* drawn separately; *(c) T. lewisi* with appendage 2*a* drawn separately; *(d) T. reductus*; *(e) T. linearis*.

darker markings ; hypopygium (Text-fig. 14, *d*) with narrow anal point with about six dots at its base ; appendage 1 small and reduced, 1*a* long by comparison and straight, 2*a* with fewer hairs than in some species.

Female resembles male but wings more hairy ; macrotrichia reach back nearly to base of cell R_5, there is a short line in cell M_1, posterior fork is bordered anteriorly, there is a small patch in fork cell ; veins M_4, Cu and An with macrotrichia.

Holotype male in the British Museum, type locality CAPE PROVINCE : Berg River, Piquetberg.

DISTRIBUTION. CAPE PROVINCE : series from Berg River, Piquetberg, Hermon, Cecilia's Drift, Wellington. BELGIAN CONGO : 2 ♂, Kiavinionge (N. lac Ed.), iii.1953 (*J. Verbeke*) ; 1 ♂, Kasenyi (L. Albert), vii.1953 (*J. Verbeke*). SUDAN : 3 ♂, Amadi, vi–vii.1954 (*E. T. M. Reid*). FRENCH WEST AFRICA : 1 ♂, Haute Volta, nr. Banfora, xii.1956 (*J. Hamon*).

Tanytarsus (Cladotanytarsus) linearis Freeman

Tanytarsus (*Cladotanytarsus*) *linearis* Freeman, 1954, *Proc. R. ent. Soc. Lond.* (B) **23** : 180.

A small dark green species, stripes black, abdomen unmarked, wings with rather more macrotrichia than usual in the male, they are also present on fork and anal veins ; hypopygium differs from other species by the wide triangular anal point and broad appendage 1 which has 1*a* hardly longer.

Male. Wing length 1·2 mm.

Head, antennae and mouthparts black, A.R. 0·75. *Thorax* with dark green background ; stripes black and more or less separate, postnotum and sternopleuron black. *Legs* pale brown, L.R. about 1·8, tarsal beard absent. *Wings* with macrotrichia present as patches at apices of cells R_5, M_2 and M_4 and as lines in centres of cells R_5 (to the base) and M_2 (for half length of vein M_1), along each side of posterior fork veins nearly to wing base and as a line along An ; in addition there is a line of macrotrichia just inside the posterior margin ; posterior fringe rather long, veins M, Cu and An with macrotrichia. Halteres pale. *Abdomen* dark green ; hypopygium (Text-fig. 14, *e*) with anal point broad and triangular, appendage 1 fairly broad, 1*a* hardly longer, 2*a* with long sparse hairs.

Female not known.

Holotype male and paratypes in the British Museum (type locality CAPE PROVINCE: Platteklip Gorge), no further material is known.

Genus ***STEMPELLINA*** Bause

Stempellina Bause, 1914, *Arch. Hydrobiol. Suppl.* **2** : 120 ; Goetghebuer, 1938, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*) : 96.

Tanytarsus subg. *Stempellina* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 419.

Eyes bare, male antenna with only 11 distinct segments, small frontal tubercles present, scutellum with only two long bristles which are placed close together at the apex, tibial combs small and separate, only one armed with a slender spur, wings cuneiform and lacking anal angle, fringe long, R_{4+5} ending before or above tip of M_{3+4}.

The species in this genus are all small or very small, the Palaearctic ones have larvae with a case-bearing habit similar to that of *Zavrelia*. The adults may easily be distinguished from *Zavrelia* by the bare eyes ; they are best separated from *Tanytarsus* by the wing shape and venation.

KEY TO AFRICAN SPECIES OF *Stempellina*

L.R. 2·4–2·8, appendage 2*a* of male long and narrow (Text-fig. 15, *a*) *chambiensis* Goetghebuer

L.R. 1·5, appendage 2*a* of male shorter and truncate (Text-fig. 15, *b*) . *truncata* sp. n.

Stempellina chambiensis Goetghebuer

Thienemanniella (*sic* !) *chambiensis* Goetghebuer, 1935, *Rev. Zool. Bot. Afr.* **27** : 365.

As explained in a previous Part of these Studies (*Bull. Brit. Mus.* (*Nat. Hist.*) **4** : 365), I have examined the type series of both *Thienemanniella chambiensis* and *trivittata* Goetghebuer in Musée Royal du Congo Belge. There are six specimens, three under each species, each specimen bearing an author's identification label. Goetghebuer does not mention the female of *chambiensis* but the specimen marked holotype is in fact a female and the allotype is a male. The third specimen under this species is a female of *Thienemanniella trivittata*. There is a third specimen of *chambiensis* (a male) labelled as the holotype of *trivittata*, a species in which the holotype should be a female.

It is obvious that there has been a good deal of muddle over the labelling of the specimens and I have decided that the three specimens of *chambiensis* are best treated as cotypes especially as no holotype is mentioned in the description. I have selected a male from Mugunga as the lectotype.

Goetghebuer's description and figure of the wing of *chambiensis*, with its longer costa and macrotrichia on the membrane, make it clear that the species does not belong to *Thienemanniella*. It is abundantly clear from the specimens (L.R. 2·4) that they do not even belong to the Corynoneurinae but to the Chironominae. The species is a typical member of the genus *Stempellina*, falling into Edwards' group B, very similar structurally to the Palaearctic species *S. minor* Edwards but easily separated by the pale coloration, much smaller size (wing length 0·7 against 1·3) and greater leg ratio (2·4 or more against 1·6). It is a minute insect with dark knees, narrow wings, long wing-fringe and bare eyes ; L.R. 2·4–2·8, A.R. only about 0·5.

Male. Wing length 0·7 mm.

Head pale, very small frontal tubercles present, eyes bare, dorsal narrow portion hardly developed so that eyes almost reniform ; antennae with 11 segments, segments quite short at base but progressively increasing until tenth is three times as long as wide ; eleventh segment three times length of tenth, A.R. 0·5. *Thorax* greenish white, mesonotal stripes separate ; stripes, sternopleuron and postnotum brownish yellow ; so far as can be seen scutellum with two bristles only. *Legs* pale, apices of femora and knees darkened, tibial combs small, well separated, only one spur present which is long and curved; L.R. 2·4–2·8, pulvilli absent. *Wings* cuneiform and with long hair fringe; costa retracted, so that it is just basal to level of tip of M_{3+4}, macrotrichia present at apex and as hair lines in cells R_5 and M_2. Halteres dark. *Abdomen* brown; hypopygium (Text-fig. 15, *a*) very similar to *S. minor* Edwards; anal point well developed, styles short, appendage 1 either as shown or rather more oval, 1*a* absent, 2*a* long, narrow and with simple hairs.

Female very like the male; macrotrichia more numerous and hair lines extend nearer the wing base.

Lectotype male, BELGIAN CONGO: Parc National Albert, Cratère Mugunga, in Musée Royal du Congo Belge.

DISTRIBUTION. BELGIAN CONGO: lectotype and paratype, Cratère Mugunga; 1 ♀, paratype, Escarpement Kabasha, Chambi, x.1933. SUDAN: 1 ♂, Amadi, vi–vii.1954 (*E. T. M. Reid*). TRANSVAAL: 1 ♂, nr. Nelspruit, ix.1954 (*A. D. Harrison*).

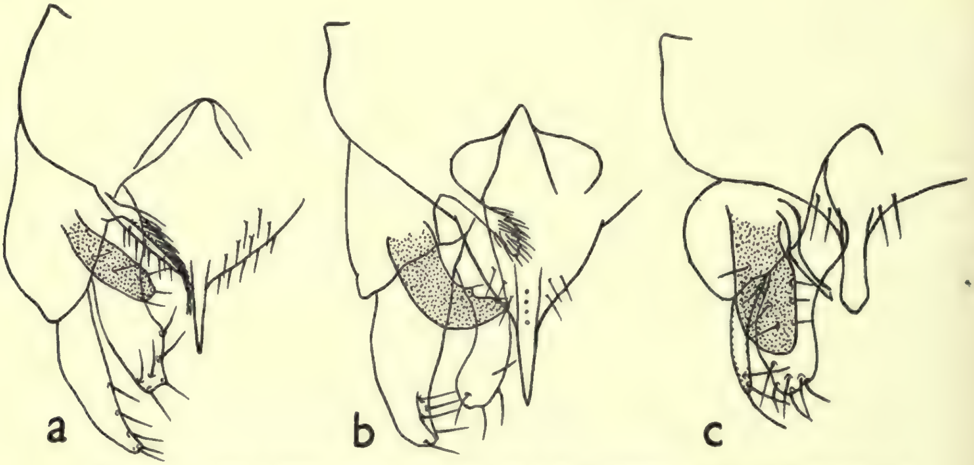

FIG. 15. Male hypopygia of *Stempellina* and *Zavrelia*. *(a) S. chambiensis; (b) S. truncata; (c) Z. kribiensis.*

Stempellina truncata sp. n.

Darker than *chambiensis* and with higher antennal ratio and lower leg ratio, otherwise very similar in appearance; male hypopygium quite different, anal point with row of dots, appendage 1 curved and larger, appendage 2*a* short and blunt.

Male. Wing length 1·0 mm.

Head brown, small frontal tubercles present, eyes bare and practically reniform, antennae brown, with 11 segments, A.R. nearly 1. *Thorax* brown, paler on the shoulders; lines of bristles and prescutellar area pruinose. *Legs* brown, L.R. 1·5, pulvilli absent. *Wings* cuneiform and with long fringe, macrotrichia present at apex, on veins and as lines around margin of anal cell and along centres of cells R_5 and M_2 almost to their bases ; R_{4+5} ending just basal to level of apex of M_{3+4}. Halteres brown. *Abdomen* dark brown ; hypopygium (Text-fig. 15, *b*) differing from *chambiensis* in the presence of a row of dots on the anal point and in the shorter, truncate appendage 2*a* ; styles stout, appendage 1 broad and curved.

Female very similar to male, wings not more heavily covered with macrotrichia.

Holotype male and 1 ♂, 1 ♀ paratypes CAPE PROVINCE : Berg River, Driefontein, xii.1954 (*K. M. F. Scott*). Further paratypes—NATAL : 1 ♂, 2 ♀, Tugela River, Drakensburg, 5,000 ft., ix.1953 (*A. D. Harrison*). All specimens are in the British Museum.

Genus *ZAVRELIA* Kieffer

Zavrelia Kieffer, 1914, *in* Bause, *Arch. Hydrobiol. Suppl.* **2** : 73 ; Goetghbuer, 1938, *in* Lindner, *Flieg. Pal. Reg.* **3** (13*c*) : 95.
Tanytarsus subg. *Zavrelia* Edwards, 1929, *Trans. ent. Soc. Lond.* **77** : 419.

Eyes pubescent, male antenna with 11 segments, female antenna with 5 or 6 segments, small frontal tubercles present, scutellum with several marginal bristles, combs of tibiae small and separate, both with long slender spurs in the single African species, pulvilli absent, wings cuneiform, R_{4+5} ending distinctly before level of tip of M_{3+4}.

The single African species falling into this genus differs from the Palaearctic species by the presence of a slender spur on each tibial comb, by the peculiar appearance of the male hypopygium and by the much broader wings. However, the pubescent eyes and short radius cause it to fall very easily into *Zavrelia* where I am leaving it for the present. Discovery of the larva will show whether it resembles the Palaearctic species in the case-bearing larval habit.

Zavrelia kribiensis Kieffer

Zavrelia kribiensis Kieffer, 1923, *Ann. Soc. ent. France*, **92** : 167.

A minute brown insect with greenish abdomen, wings thickly clothed all over with macrotrichia ; easily separated from other species of the Tribe by the pubescent eyes and by the reduced and narrow male styles. Although I have not seen the type which is probably lost, the thickly clothed wings and presence of two tibial spurs suggest that the Cape specimens are of the same species as Kieffer's.

Male. Wing length 0·9 mm.

Head yellowish brown, antennae with 11 segments, A.R. about 0·5, eyes strongly pubescent, small frontal tubercles present. *Thorax* yellowish with brown stripes and postnotum ; dorso-central and acrostichal bristles long, scutellum with four long bristles. *Legs* pale yellowish brown, L.R. 1·8, pulvilli absent, tibial combs small and well separated, each with a long thin spur. *Wings* cuneiform, thickly clothed all over with macrotrichia ; R_{4+5} ending well before level of apex of M_{3+4}, halteres with dark tips. *Abdomen* either pale green or else with slightly darker bands at the incisures ; hypopygium (Text-fig. 15, *c*) highly characteristic and quite unlike the

Palaearctic species *nigritulus* Goetghebuer; anal point stout, coxite rounded, appendage 1 greatly exaggerated, 1*a* absent, 2 sinuous, 2*a* bent and expanded at apex, especially in side view; styles finger-like and with three long hairs at apex.

Female similar to male in colour and wing structure, antennae with 6 segments, the last 2 subequal.

The holotype female is probably lost, type locality FRENCH CAMEROONS: Kribi.

DISTRIBUTION. CAPE PROVINCE: 1 ♂, Berg River, Driefontein, xii.1954 and 1 ♂, 1 ♀, French Hoek Forest Reserve, iii.1955 (*K. M. F. Scott*).

UNRECOGNIZED SPECIES AND GENERA OF TANYTARSINI DESCRIBED BY KIEFFER

Tanytarsus africanus, 1913, *Voy. All. Jean. Afr. Or. Ins. Dipt.* **1**: 26. Based on a pale male and female from KENYA: Taveta. Only a female remains in spirit in the Muséum National d'Histoire Naturelle, Paris; it was separated by Kieffer from other species by the moniliform antennal segments and fusion of segments 5 and 6.

T. misorus, 1913, *ibid.*: 26. Based on a pale female with dark knees from KENYA: Ramisi; type not marked in the Paris Museum, but it is not impossible for it to be an earlier description of *Stempellina chambiensis*.

T. tropicalis, 1913, *ibid.*: 27. Described from a yellow female from KENYA: Taveta; again separated from others by details of antennae, in absence of males cannot be associated with known species.

T. brachyopsis, 1913, *ibid.*: 27. The female type, which is in the Paris Museum, is pale with dark thoracic markings, type locality KENYA: Kijabe. Kieffer separated it from the others by the last antennal segment being twice as long as the preceding and by the wings being covered all over with macrotrichia.

T. apicalis, 1913, *ibid.*: 28, was described from females, now in Paris Museum (KENYA: Taveta), which are yellow with brown thoracic markings, similar to *brachyopsis*, but separated from that species by the wing macrotrichia being confined to the apex.

Kribiobius Kieffer, 1921, *Ann. Soc. ent. France*, **90**: 31. This genus was erected to include a female now lost, with bare wings, two tibial spurs and 6-segmented antennae, the last segment being swollen basally and carrying a verticil. From the leg proportions it seems possible that this was a species of *Tanytarsus* even though he mentions that the cross-vein was oblique and the membrane bare. However, species of *Tanytarsus* in spirit often have wings appearing bare and Kieffer was quite unreliable in his use of the term "oblique" for the cross-vein, I am, therefore, tentatively placing *Kribiobius* as an unknown genus of the Tanytarsini.

K. modestus, 1923, *ibid.* **92**: 165; yellowish with thoracic markings sandy, length 2 mm., type female lost, locality FRENCH CAMEROONS: Kribi.

Clinotanytarsus, 1921, *ibid.* **90**: 34. This genus has no real points of difference from *Tanytarsus* except that the cross-vein is described as oblique. Following Edwards (1929), I am assuming it to be a probable synonym.

C. nilicola, 1923, *ibid.* **92**: 169 is the type species of the genus; it is large, 3–3·2 mm. long, the abdomen has brown incisures but the thoracic markings are pale; no figure is given of the male hypopygium and I have not found it possible to identify the species from the material at my disposal. Type series lost, locality SUDAN: S. of Khartoum.

Hexatanytarsus, 1921, *ibid.* **90**: 34 is separated from *Clinotanytarsus* by the 6-segmented female antennae, very short empodium and single tibial spur. It is probably a synonym of *Tanytarsus*.

H. albiradix, 1923, *ibid.* **92**: 170 was described from a whitish female with black-brown thoracic markings; the wings were sparsely hairy in the distal part, posterior fork strongly distal to cross-vein; type lost, locality FRENCH CAMEROONS: Kribi.

Paratanytarsus Bause was used by Kieffer, 1923, *ibid.* **92**: 171 for seven species of which all the types are lost. Six were known in the female only and no figure was given of the male hypopygium of that of which the male was known (*hirtipes*). *P. hirtipes* and *niloticus* were from SUDAN: Shambe; *longiceps, kribiensis, brevitibia, brevicornis* and *sessilis* were from FRENCH CAMEROONS: Kribi. As with other species, he separated them on details of antennal and leg structure and also on mesonotal colour: I have not been able satisfactorily to recognize any of them.

Tanytarsus nilobius, 1923, *ibid.* **92**: 176 was described from a yellowish female from SUDAN: Mongola; antennae with 5 segments, wings covered with macrotrichia, posterior fork well distal to cross-vein. It is not possible to recognize this species.

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PLATE 1

Wings of females of *Polypedilum (Polypedilum)*. *(a) P. alticola ; (b) P. natalense ;* (*c*) *P. deletum ;* (*d*) *P. tenuitarsis ;* (*e*) *P. annulatipes ;* (*f*) *P. abyssiniae ;* (*g*) *P. quinqueguttatum ; (h) P. longicrus ; (i) P. tropicum ; (j) P. pruina ; (k) P. aegyptium ; (l), (m),* (*n*), (*o*) variations of *P. griseoguttatum ;* (*p*) *P. ramiferum ;* (*q*) *P. albosignatum ;* (*r*) *P. alboguttatum*.

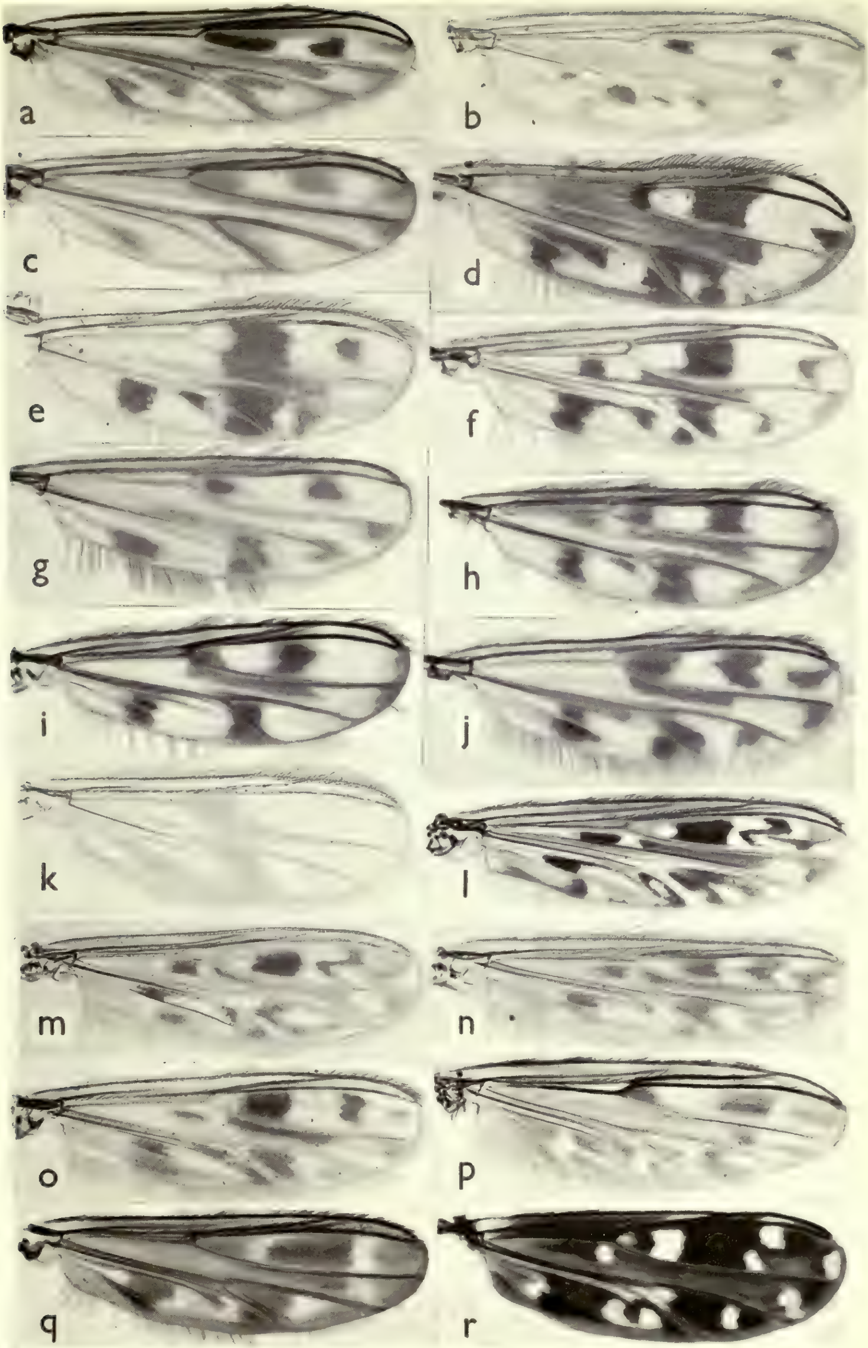
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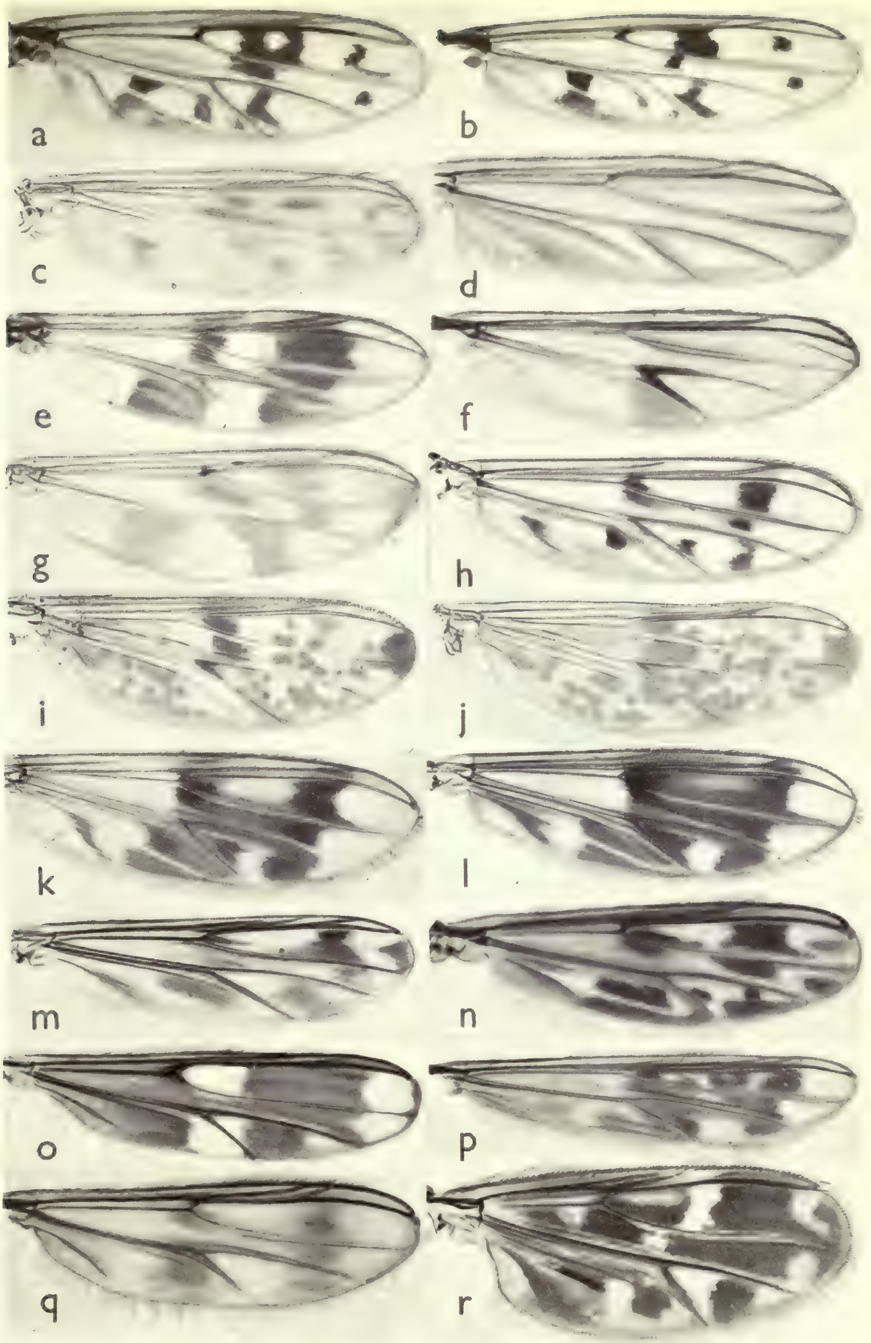
PLATE 2

Wings of Chironomini, all females except for (*p*) and (*r*). (*a*) *Stictochironomus festivus festivus ;* (*b*) *S. festivus imperforatus ;* (*c*) *S. caffrarius ;* (*d*) *S. fusiformis ;* (*e*) *S. bisignatus ;* (*f*) *Microtendipes umbrosus ;* (*g*) *M. albus ;* (*h*) *M. taitae ;* (*i*) *M. lentiginosus* holotype ; (*j*) *M. lentiginosus* paratype ; (*k*) and (*l*) *M. bifasciatus ;* (*m*) *Kribiocosmus ornatipes ;* (*n*) *Lauterborniella fuscoguttata ;* (*o*) *L. pulchra ;* (*p*) *L. longiventris ;* (*q*) *L. pallidipes ;* (*r*) *Kribiothauma pulchellum.*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NATURAL HISTORY

NEW SPECIES OF INDO-AUSTRALIAN GEOMETRIDAE

L. B. PROUT

BULLETIN OF
THE BRITISH MUSEUM (NATURAL HISTORY)
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LONDON : 1958

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BY

L. B. PROUT xuf.

Pp. 365–463; 72 *Text-figures*

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NEW SPECIES OF INDO-AUSTRALIAN GEOMETRIDAE

By L. B. PROUT

PART I

[Plates 29-34, 36-41 and plate 50 of volume **12** of Seitz, *Macrolepidoptera of the World,* were published without all the relevant text, the only copy of the manuscript being destroyed during the war. In order to validate the names of those new species which were figured on these plates, descriptions have been prepared from Mr. Prout's notes and papers, which came to this department after his death. Revised descriptions with comparative notes and full type data have been included for a number of species described in the German edition of vol. **12,** and published in 1940–41. All the specimens listed are in the British Museum (Natural History) with the single exception of the type of *Chloroclystis antarctica* Hudson ab. *hudsoni* ab. n., which is in the collection of Mr. G. V. Hudson in New Zealand.

Part I also includes a legend to all the species illustrated on the plates listed above : due to the war Mr. Prout did not have the opportunity of correcting proof copies of these plates, which were printed in Germany, and they appeared with a number of the names wrongly spelt or transposed. With the exception of those species described in the following pages, each name is followed by the date of its original publication.

The colour names used in the descriptions are taken from Ridgway, *Color Standards and Color Nomenclature.*—D. S. Fletcher, Dept. of Entomology, British Museum (Natural History).]

Eustroma hampsoni sp. n.

(Pl. 31 : A as *interplagata*)

Cidaria interplagata Guenée Hampson *nec* Guenée, 1895, *Moths of India,* **3** : 358.

Guenée's type of *Cidaria interplagata* (1858) has proved to be a species of *Arichanna* closely related to *A. ramosa* Walker (1866) in the subfamily Ennominae. The species which Hampson described very fully in the *Moths of India,* based on a single male from Sikkim, has therefore been renamed.

Pareustroma conisecta Prout

(Pl. 31 : C)

♂♀ 36-38 mm. Face, head, thorax and abdomen cinnamon buff irrorate with fuscous ; basal halves of patagia and tegulae fuscous ; thorax with a large fuscous spot medially. Fore wing mummy brown. Basal fascia double and fuscous, marked on anterior half of wing only; proximal line slender, distal line broad. Medial area shaped as illustrated, fuscous; subterminal fascia consists of pale interneural spots; termen slenderly and brokenly fuscous. Hind wing cartridge buff irrorate with fuscous, rather more densely in the terminal area. Distinguished from the other species in the genus by the smooth, diagonal, proximal margin of the very distinctly shaped medial area.

W. CHINA: Tien-Tsuen, 1903 (*Chasseurs indigènes du P. Déjean*), 2 ♂, 2 ♀, including holotype and allotype; Ta-tsien-lou, 1910 (*Chasseurs indigènes*), 1 ♂.

THIBET: Frontière orientale, 1905 (*Chasseurs indigènes du P. Déjean*), 1 ♀.

Lobogonodes multistriata tensa Prout

(Pl. 31 : D)

Differs from *m. multistriata* Butler (1889) in the suffusion of both wings with fuscous black; as a result the white pattern is more sharply contrasted with the ground colour.

INDIA: Assam, Shillong (*H. M. Parish*), holotype ♂; *ibid.*, 17.viii.1909, 2 ♀, including allotype.

Lobogonodes complicata dactylotypa Prout

(Pl. 31 : D)

Differs from *c. complicata* Butler (1879) in the suffusion of both wings with fuscous black; the ochraceous tawny colouring, which, in the nominate subspecies extends proximad from the termen to the postmedial fascia, is completely suppressed.

FORMOSA: Kanshirei, 1,000 ft., 10.v.1908 (*A. E. Wileman*), holotype ♂; *ibid.*, 14.v.1908, 1 ♂; 23.vi.1908 allotype ♀; 19.viii.1908, 1 ♂; 12.x.1908, 1 ♀.

Hysterura vacillans Prout

(Pl. 31 : C)

♂ 33-36 mm. Fore wing cinnamon buff with a hair tuft on the underside as in *H. cervinaria* Moore (1867); basal third of wing transversed by four parallel fasciae, each consisting of interneural spots of varying sizes, which are fuscous slenderly ringed with cartridge buff; medial area similarly coloured, shaped as in illustration, trifurcate costad; subterminal fascia fuscous, strongly marked from costa to vein R_1, edged and slenderly divided along vein Sc_5 by cartridge buff, then marked by four similarly coloured spots of smaller size, one between veins R_2 and R_3 and three posterior of vein M_2. Apical streak fuscous edged with cartridge buff. Hind wing slightly angled at vein M_1, tilleul buff; termen slenderly fuscous. Differs from *cervinaria* Moore in the slightly angled hind wing and in the distinctive shape of the medial area of the fore wing.

W. CHINA: Ta-tsien-lou, 1910 (*Chasseurs indigènes*), holotype ♂; Siao-Lou, 1902 (*Chasseurs indigènes du P. Déjean*), 1 ♂.

THIBET: Frontière orientale, 1905 (*Chasseurs indigènes du P. Déjean*), 1 ♂.

Hysterura protagma Prout

(Pl. 31 : D)

♂ 38 mm. Fore wing with a tuft of long, pale ochraceous buff hair along the underside of the inner margin ; the upperside is light vinaceous cinnamon irrorate with fuscous proximad of the postmedial fascia and with cinnamon brown distad of it and terminad between vein R_1 and the tornus ; basal third of wing with four parallel fasciae consisting of fuscous spots ringed with cartridge buff ; medial area similarly coloured, consisting of one triangular patch posterior of the lower median vein and several spots anterior of it ; subterminal fascia, distally dentate from costa to vein R_2, fuscous edged with cartridge buff, then marked as spots, one between veins R_3 and R_2 and three between M_2 and the inner margin ; two similar spots near apex, one between veins Sc_5 and Sc_4 and one between Sc_5 and R_1. Hind wing acutely angled and slightly produced between veins R_3 and M_1, pale drab suffused with light vinaceous cinnamon in posterior half ; termen cinnamon brown ; postmedial fascia and anterior half of subterminal fascia pale ; posterior half of subterminal fascia represented posterior of vein R_3 by fuscous spots ringed with warm buff. Distinguished from other known species by the size and colour of the tuft along the inner margin of the underside of the fore wing, by the pattern of the medial area and the subterminal fascia of the fore wing, and by the acute angling of the hind wing.

INDIA : Assam, Cherrapunji, i.1894, holotype ♂; Khasia Hills, 2 ♂.

BURMA : East Pegu, 4-5,000 ft., iii-iv.1890 (*W. Doherty*), 1 ♂.

Hysterura protagma agaura Prout

♂ 42 mm. Differs from *p. protagma* in its larger size and in the brighter and more intense cinnamon brown irroration distad of the medial area and terminad between vein R_1 and the tornus of the fore wing.

FORMOSA : Arizan, 7,300 ft., 28.iii.1908 (*A. E. Wileman*), holotype ♂.

Amnesicoma albiseriata condigna Prout

Differs from *a. albiseriata* Warren (1893) in the more clearly marked, white transverse fasciae, and in the reduction of the white cell marks on the fore wing to two small spots.

TIBET : Chumbitang, 13,000 ft., 25.vii.1924 (*Maj. R. W. G. Hingston*), holotype ♂; Chumbi Valley, 1 ♂.

Photoscotosia indecora Prout

(Pl. 31 : E)

♂ 49 mm.; ♀ 47 mm. Hair tuft on underside of fore wing in male cartridge buff, short, extending to just beyond level of mid-cell. Both wings fuscous. Fore wing very lightly irrorate with olive buff ; basal, ante- and postmedial fasciae white ; subterminal fascia white, represented by longitudinal dashes between the veins ; terminal interneural dots and apical streak warm buff ; cell spot elongate and white, cut by veins Sc_5, R_1 and R_2 ; and additional white spot is situate close to lower median vein between veins M_1 and M_2. On the hind wing the postmedial fasciae are white, weakly marked. Distinguished from *P. amplicata* Walker (1862) by the small white hair tuft on the underside of the fore wing in the male and by the uniformly fuscous hind wing in both sexes.

THIBET: Kharta, 12,000 ft., 30.vii.1921 (*G. H. Bullock*), holotype ♂; Kama Valley, 12,000 ft., 27.viii.1921 (*A. F. R. Wollaston*), allotype ♀.

Photoscotosia prosenes Prout

(Pl. 31 : F)

♂♀ 44 mm. Underside of male fore wing with a fuscous hair tuft along the middle of the lower median vein, partially covering a large area of black scaling situate medially in the posterior half of the wing. Fore wing cartridge buff densely irrorate with light grayish olive; transverse fasciae, medial area and subterminal area shading to drab, ill-defined; subterminal area edged distally by a white, lunulate fascia, represented posterior of vein R_3 by interneural spots only; between the medial and the subterminal areas the veins are warm buff. Hind wing cartridge buff, termen and anal margin light grayish olive; subterminal fascia faintly marked by white interneural spots posterior of vein R_3; termen slenderly warm buff. Distinguished from the rather similarly coloured *P. palaearctica fusca* Staudinger (1901) by the smaller hair tuft on the underside of the male fore wing and by the lack of brown irroration on the upperside of both wings.

TIBET: Rongshar Valley, 12,500 ft., 25.vii.1921 (*A. F. R. Wollaston*), holotype ♂ and allotype ♀.

Photoscotosia dipegaea Prout

(Pl. 31 : G)

♂ 50 mm. Underside of fore wing with a large patch of black scales covered by a tuft of long hair and situate medially posterior of the lower median vein. Fore wing cartridge buff irrorate with ochraceous tawny and fuscous, very lightly proximad of the antemedial fascia, in the proximal anterior fourth of the medial area, immediately distad of the postmedial fascia and at the apex; basal and antemedial fasciae broad and straight, the latter strongly marked; postmedial fascia slender and dentate; all fasciae fuscous; cell spot very slender. Hind wing cartridge buff, termen and anal margin lightly irrorate with fuscous; subterminal fascia represented by pale interneural spots posterior of vein R_3. Distinguished at once by the broad, straight, antemedial fascia and by the slender, pale, contrasting fascia distad of the postmedial on the fore wing.

SW. CHINA: Yunnan, Mekong-Yangtse Divide E. of Tsekou, Pei-ma-shan, 14,000 ft., 23.vii.1922 (*Prof. J. W. Gregory*), 2 ♂, including holotype.

Photoscotosia annubilata Prout

(Pl. 31 : H)

♂ 50 mm. Underside of fore wing with a hair tuft extending along the lower median vein; the hair is light buff tipped fuscous. Upperside of fore wing as in *P. nubilata* Moore (1888). Hind wing: anterior proximal fourth white, apex warm buff, remainder fuscous ; the subterminal and the double postmedial fasciae are white and marked at the anal margin only. Differs from the closely related *nubilata* in lacking the patch of black scales beneath the hair tuft and in the pattern of the hind wing, in lacking the broad, warm buff costal area of that species.

INDIA : Sikkim, 12,000 ft. (*Ex coll. H. J. Elwes*), holotype ♂.

Photoscotosia polysticha Prout

(Pl. 32 : A)

♂ 48-50 mm. ; ♀ 54-56 mm. Darker than *P. pallifasciaria* Leech (1897), with which it had been confused by Hampson in the B.M. collection. Perhaps better compared with the well-known *P. atrostrigata* Bremer (1864), from which it differs in the fore wing in the marked russet suffusion ; in the female the single, broad basal fascia and in the male the many fine basal fasciae are straighter ; in both sexes the antemedial is less sinuous, the postmedial has a single, shallow inward curve between veins R_1 and M_1 and the posterior lunules are also shallow ; the subterminal fascia is more punctiform, the spot posterior of vein SM_2 being larger in the female than in the male. Hind wing nearly as in *atrostrigata*, but having the terminal area suffused with russet and the irregularly marked subterminal fascia punctiform instead of lunulate.

INDIA : Sikkim, Yatong (*Bingham*), 1 ♂, 2 ♀, including holotype and allotype.

TIBET : Yatung (*A. E. Hobson*), 1 ♂, 4 ♀ ; Kama Valley, 10,000 ft., 24.viii.1921 (*A. F. R. Wollaston*), 1 ♂ ; Chumbi Valley, Dopenri, 1 ♀.

Photoscotosia isosticta Prout

(Pl. 32 : B)

♂♀ 44-50 mm. Similar in colour and pattern to *P. miniosata* Walker (1862), but differs in the fore wing ; proximad of the antemedial fascia, which is angled in the posterior corner of the cell, the wing is uniformly suffused with fuscous. Differs also in the hind wing ; in the male there is more white anteriorly and in the female there is a dentate postmedial fascia. The species is at once recognizable by the underside of the fore wing ; the fuscous terminal and apical suffusion is extended proximad along the costa to absorb the large fuscous spot at two-thirds costa, which is so conspicuously isolated in *miniosata*.

W. CHINA : Siao-Lou, 1903 (*Chasseurs indigènes du P. Déjean*), 13 ♂, 2 ♀ including holotype and allotype ; Ta-tsien-lou, 1906 (*Chasseurs indigènes*), 1 ♂, 1 ♀; *ibid.*, 1910, 1 ♂ ; Tien-Tsuen, 1903 (*Chasseurs indigènes du P. Déjean*), 3 ♂, 1 ♀.

THIBET : Frontière orientale, 1906 (*Chasseurs indigènes du P. Déjean*), 3 ♂, 2 ♀.

Photoscotosia prasinotmeta Prout

(Pl. 32 : B)

♂ 50 mm. Similar in wing shape and pattern to *P. propugnataria* Leech (1897) but distinguishable from the male of that species by the colour of the hind wing ;

the proximal two-thirds of the anterior half is white, the distal third is orange buff ; the posterior half is fuscous suffused terminally with russet. In *propugnataria* only the anterior third of the hind wing is white and the apex is straw yellow ; the only orange buff colouring is confined to a small area distad of the discocellulars and the termen is suffused with russet only near the apex.

W. CHINA : Ta-tsien-lou, 1899 (*Chasseurs indigènes du P. Déjean*), holotype ♂.

THIBET : 1897 (*Chasseurs Thibetains—ex P. Déjean*), 1 ♂.

Calleulype compositata apothetica Prout

Differs from *c. compositata* Guenée (1858) in the loss of all or nearly all the fuscous pattern on the terminal fourth of the hind wing anterior of vein R_1 ; in some specimens the transverse fasciae on the fore wing are broadened and fused.

W. CHINA : Tse Kou, 1895 (*R. P. Dubernard*), holotype ♂ ; Ta-tsien-lou, 7,500 ft., vii.1889 (*A. E. Pratt*), 1 ♂ ; Ta-tsien-lou, 1906 (*Chasseurs indigènes*), 1 ♂, 1 ♀ ; Siao-Lou, 1903 (*Chasseurs indigènes du P. Déjean*), 1 ♀ ; Ichang, 2 ♂, 1 ♀.

THIBET : Frontière orientale, 1906 (*Chasseurs indigènes du P. Déjean*), 1 ♀.

Gandaritis flavata postscripta Prout

♂ 79-83 mm. Fore wing with medial area placed more proximally than in *f. flavata* Moore (1867) ; the ante- and postmedial fasciae are double as in *f. flavata*, but the two lines of each fascia are wider apart. The hind wing has a conspicuous subterminal shade extending from vein R_1 to the anal angle, ill-defined distally but sharply defined proximally, where it is strongly dentate with acute teeth pointing proximad on the veins.

CHINA : Yunnan, Wei-Si, i.1917 (*Père Ouvrard*), 2 ♂ including holotype.

Dysstroma ceprona (Swinhoe) ab. ***rufescens*** Prout

A form parallel to *Dysstroma truncata* (Hufnagel) ab. *rufescens* Strom ; the fore wing is suffused with ochraceous tawny between the antemedial and the subterminal fasciae, anterior of vein *SM*.

W. SUMATRA : Korinchi, 7,300 ft., v.1914 (*Robinson & Kloss*), holotype ♀.

Philereme vashti basilis Prout

Differs from *v. vashti* Butler (1878) in the browner, less black colour of the wings, which are fuscous ; those of *v. vashti* are fuscous black. Between the costa and vein R_1 on both the upper- and undersurfaces of the fore wing, the postmedial fascia is broadly and conspicuously cartridge buff ; in *v. vashti* it is scarcely traceable and often wanting.

W. CHINA : Che-tou, 11,070 ft., vii-viii.1890 (*Native coll.*), 2 ♂ including holotype ; Pu-tsu-fong, 9,820 ft., vi-vii.1890 (*Native coll.*), 1 ♂ ; *ibid.*, 8-10,000 ft., vii.1890, 1 ♂ ;

Ta-tsien-lou, 65 ♂, 43 ♀; Siao-Lou, 1900 (*Chasseurs indigènes*), 5 ♂, 10 ♀; Moupin, 1 ♀; Szechuan, Kunkala-shan, 1 ♂.

THIBET : Frontière orientale (*Chasseurs indigènes du P. Déjean*), 26 ♂, 6 ♀.

Triphosa acyrota Prout

(Pl. 33 : C)

♂ 41-43 mm.; ♀ 44 mm. Male. Fore wing wood brown to avellaneous, lightly but evenly irrorate with fuscous; sub-basal, basal, ante- and postmedial fasciae broad, dentate and fuscous; the ante- and postmedial fasciae are sharply defined in the anterior half of the wing, the postmedial being strongly toothed distad between veins R_3 and M_1; proximad of the subterminal fascia, which is cartridge buff and punctiform, there is an area of fuscous; cell spot fuscous. Hind wing uniformly wood brown to avellaneous, the postmedial fascia fuscous, but marked only at the anal margin. In the female the ground colour of both wings is cartridge buff and the transverse fasciae are as a result more sharply defined. Similar in size to *T. rantaizanensis* Wileman (1916), but more sharply marked and with the postmedial fascia of the fore wing more strongly toothed between veins R_3 and M_1.

PHILIPPINE ISLANDS : N. Luzon, 5-6,000 ft. (*Whitehead*), 2 ♂, 1 ♀, including holotype and allotype.

Triphosa praesumtiosa Prout

(Pl. 33 : E)

♂♀ 47-51 mm. Rather larger than *T. rantaizanensis* Wileman (1916), which has a wing span of 42-44 mm. The wings are less dark than in that species, being similar in colour and pattern to the preceding species, though not so glossy and more strongly marked; on the fore wing the anterior projection of the postmedial fascia is a little stronger and the fuscous costal area proximad of the subterminal fascia is more strongly marked.

In the male genitalia the uncus in *rantaizanensis* is evenly curved from base to tapered apex; in *praesumtiosa* it is broadened from base to middle, then sharply narrowed by one-half and tapered to the apex.

FORMOSA : Rantaizan, 10-11.v.1909 (*A. E. Wileman*), 2 ♂, 2 ♀, including holotype and allotype.

Triphosa empodia Prout

(Pl. 33 : G)

Larentia albiplaga Oberthur Hampson *nec* Oberthur, 1895, *Moths of India*, **3**: 370 (part).

♂ 40-42 mm.; ♀ 50 mm. Fore wing bister, basal, medial and terminal areas fuscous; basal, ante- and postmedial fasciae very lightly irrorate with white; medial fascia similarly irrorate in a few examples; cell spot slender, fuscous black, followed distally in some examples by a small area of white; subterminal fascia white and punctiform, the spot between veins R_3 and M_1 often being large. Hind wing bister ; fringes chequered with white in anterior half of the wing ; postmedial and subterminal fasciae slenderly white in some examples. Underside : fore wing bister with two areas of white, one distad of the discocellulars extending to the faintly marked postmedial fascia, the other distad of the postmedial fascia between veins R_3 and M_1 ; hind wing similar to the upperside. Differs from *T. hydatoplex* Prout (1938) in the reduction of the white markings on the fore wing.

INDIA : Sikkim, 13,000 ft., 1887 (*Coll. H. J. Elwes*), holotype ♀ ; Sikkim, Yatong, 1894 (*Dudgeon*), 1 ♀ ; Kashmir Valley, vii.1903 (*Ward*), 1 ♂.

TIBET : Yatung (*A. E. Hobson*), 5 ♂ ; Rongshar Valley, 12,500 ft., 25.vii.1921 (*A. F. R. Wollaston*), 3 ♂.

BHUTAN : 1 ♂.

Triphosa macroprora Prout

(Pl. 33 : G)

♂ 42 mm. Palpus twice as long as the diameter of the eye. Fore wing light buff irrorate with warm buff and bister ; ante- and postmedial fasciae broad, densely bister ; a similar fascia is situate proximad of the pale buff, lunulate subterminal fascia ; termen slenderly fuscous proximad, warm buff distad between the veins with minute warm buff dots at the vein ends. Hind wing tilleul buff irrorate with bister, very lightly proximad, densely distad ; apex warm buff ; double postmedial fascia marked at the anal margin only ; subterminal fascia and termen as on fore wing. Related to *T. dubiosata* Walker (1862), differing in its brown instead of grey colour and in the length of the palpus ; in *dubiosata* it is one and one-half times as long as the diameter of the eye.

PHILIPPINE ISLANDS : Luzon, subprov. Benguet, Pauai, Haight's Place, 7,000 ft., 3.xii.1912 (*A. E. Wileman*), holotype ♂.

Triphosa luteimedia Prout

(Pl. 33 : H)

♂♀ 43-45 mm. Fairly broad winged especially in the female. Palpus moderate as in *T. dubiosata* Walker (1862), or scarcely longer. Fore wing more mixed with white than in *T. confusaria* Leech (1897), well variegated and scarcely glossy, the colouring about as in medium *Entephria caesiata* Schiffermüller (vol. **4,** pl. 9 : F) ; the wing is white lightly irrorate with mouse gray to fuscous ; sub-basal, basal, ante- and postmedial fasciae broad, more densely fuscous, especially costad ; terminal fourth densely fuscous and divided by the lunulate white subterminal fascia, which is more or less enlarged into a spot in part of the median fold and sometimes again posterior of it, but this latter spot is not a marked feature ; medial area more or less irrorate with straw to mustard yellow ; in some examples this is reduced to a strongly marked streak on the lower median vein. Hind wing rather variable, always moderately well marked, the distal area dark enough to render conspicuous the pale subterminal fascia.

THIBET : Ta-tsien-lou, v-vi.1892 (*Chasseurs Thibetains*), holotype ♂, 1 ♀ ; *ibid.*, eté 1893 (*R. P. Déjean*), 1 ♂; *ibid.*, 1898, allotype ♀; *ibid.*, 1902, 1 ♂; Tay-Tou-Ho, 1897 (*R. P. Déjean*), 1 ♀.

Triphosa confusaria tarachodes Prout

(Pl. 33 : G)

Differs from *c. confusaria* Leech (1897) in the suffusion of both wings with dark mouse gray, the basal, ante- and postmedial fasciae and the terminal area of the fore wing being very strongly marked.

INDIA : Sikkim, Tonglo, 10,000 ft., vii.1886 (*H. J. Elwes*), 5 ♂, including holotype; Sikkim (*Knyvett*), 1 ♂.

TIBET : Chumbi Valley, 7 ♂, 9 ♀; Chumbitang, 13,000 ft., 25.vii.1924 (*Maj. R. W. G. Hingston*), 1 ♂, 3 ♀; Kharta Valley, 11,500 ft., 24.vi.1922 (*E. F. Norton*), 1 ♂.

Calocalpe tremodes Prout

(Pl. 34 : A)

♂ 37-42 mm. Fore wing sepia; ante- and postmedial fasciae white and dentate, strongly and broadly marked at costa, but failing at the median vein; subterminal fascia white, very slender and lunulate, marked most conspicuously between veins R_3 and M_1 and by a large spot posterior of vein M_2; cell spot slender and black; medial area straw yellow round posterior half of *DC*; termen slenderly fuscous; underside paler, snuff brown except in the posterior half distad of the medial area, where the wing is irrorate with pale buff; the distal margin of the medial area is bluntly toothed distad between veins Sc_5 and R_1 and between R_3 and M_1; postmedial fascia broad, pale buff, failing as on upperside, as it merges into the pale posterior area. Hind wing drab irrorate with sepia terminally; apex and costal area largely white; postmedial fascia double, white, marked at anal margin only; subterminal fascia very slenderly lunulate, white; termen as on fore wing; underside with a dense hair tuft in the central third of interspace 1*b*. Distinguished from other oriental species of *Calocalpe* by its small size, the dark sepia colour of the wings and the restricted white area along the costa of the hind wing.

INDIA : Sikkim, Tonglo, 10,000 ft., vii.1886 (*H. J. Elwes*), 3 ♂, including holotype; Sikkim, 1886 (*O. Moller*), 2 ♂; Sikkim (*Knyvett*), 1 ♂; Sikkim, 1 ♂.

Calocalpe anestia Prout

(Pl. 34 : A)

♂♀ 43-47 mm. Fore wing bister, basal, sub-basal, medial and terminal areas most strongly marked; basal, antemedial, medial and postmedial fasciae broad and irrorate with white, the medial and postmedial failing at the submedian vein; subterminal fascia lunulate and white, broadly marked between veins R_3 and SM_1; cell spot slender and fuscous; underside pale buff lightly suffused with bister; cell spot, anterior half of distal margin of medial area and termen, between veins M_1 and M_2 and broadly between R_3 and apex, densely bister; the anterior tooth of the distal margin of the medial area is stronger and sharper than in the preceding species. Hind wing white from costa to vein R_2, termen and posterior half suffused with bister, more densely towards margins ; subterminal fascia white, slender and deeply lunulate ; underside pale buff, termen lightly suffused and veins spotted bister ; in the male there is a hair tuft similar to that of *C. tremodes*. Distinguished from that species by the paler brown colour of the wings, the better marked subterminal fascia on the fore wing and by the whiter hind wing.

India : Khasia Hills, 2 ♂, 4 ♀, including holotype and allotype.

Calocalpe titubata Prout

(Pl. 34 : A)

♂ 45-46 mm. ; ♀ 47-50 mm. Rather larger than *C. tremodes*, but similar in colour and pattern, though the latter is ill-defined ; subterminal fascia white, slender, not so conspicuously marked as in either *tremodes* or *anestia*. Hind wing almost uniformly drab, the costal area paler, especially in the female. Differs from *tremodes* in the sacculus and the juxta of the male genitalia ; in *titubata* the sacculus has two arms, one short and one long ; in *tremodes* both arms are short and of about equal length ; in *titubata* the juxta is bilobate ; in *tremodes* it is shaped as a plate.

India : Sikkim, Yatong (*Bingham*), 3 ♂, 3 ♀, including holotype and allotype.

Tibet : Kama Valley, 11,500 ft., 24.vi.1922 (*E. F. Norton*), 1 ♂.

Calocalpe valentula Prout

(Pl. 34 : A)

♂♀ 48-52 mm. Fore wing dark olive gray, very lightly irrorate with straw yellow ; centre of medial area broadly pale olive buff from costa to lower median vein, where it is tinged with straw yellow ; postmedial fascia double, slender and lunulate, the proximal line white, the distal straw yellow, marked clearly near costa then as pairs of spots on the veins ; subterminal fascia white, slender and lunulate, variable in degree of marking, but always represented by two large white spots between veins R_3 and M_1 and one between M_2 and SM_1 ; fringes chequered smoke gray and white. Hind wing smoke gray, termen broadly dark olive gray ; postmedial fascia double and pale olive buff, subterminal fascia white and lunulate, broadly marked on costa. Underside of both wings smoke gray, medial and terminal areas rather darker ; subterminal fascia white and punctiform on both wings, the spots large and conspicuous posterior of vein R_3 on the fore wing ; hind wing of male with a dense hair tuft in the distal five-eighths of interspace 1*b*. Differs from the closely related *C. tristis* Prout (1914) in the paler gray colour of the wings and the very conspicuous white subterminal spots. Differs also in the male genitalia, which are very distinctive, especially in the shape of the labides, which broaden strongly to about the middle, then taper to the apex and are covered with hair ; the uncus is broader-based than in *tristis*, tapering to a rounded apex ; the tegumen is also broader ; saccus small but shallower than in *tristis*, not so pointed ; valve more rounded, hairy ; sacculus similarly developed ; juxta not so deeply cleft nor so wide.

W. CHINA : Ta-tsien-lou (*Chasseurs indigènes*), 24 ♂, 5 ♀ including holotype and allotype ; Szechuan, Sunpanting, 1 ♂ ; Upper Yang-tse-kiang, 1 ♂.

THIBET : Frontière orientale (*Chasseurs indigènes du P. Déjean*), 4 ♂ ; Tchang-Kou, eté 1892 (*Chasseurs chinois*), 1 ♂.

Stamnodes spectatissima Prout

(Pl. 34 : C)

♀ 49-50 mm. Proximal third of fore wing fuscous ; distal third fuscous at costa, this fuscous area tapering tornad to a point at vein *SM* ; costa fuscous ; basal, antemedial, postmedial and subterminal fasciae broadly white, but marked only between the costa and the subcostal vein ; between the ante- and postmedial fasciae an area of fuscous extends from the costa to vein R_2 ; remainder of wing ochraceous tawny. Proximal half of hind wing fuscous ; costa and termen slenderly fuscous ; remainder of wing ochraceous tawny. Readily distinguishable by its colour and very large size.

W. CHINA : Ta-tsien-lou, 1898 (*Chasseurs indigènes*), holotype ♀ ; Yunnan (*George Forest*), 1 ♀.

Stamnodes depeculata lamarum Prout

(Pl. 34 : D)

Differs from other races of *depeculata* Lederer (1869) in colour ; the ground colour of the wings is cartridge buff ; the basal, costal, medial and apical markings of the fore wing are drab.

TIBET : Tasam, Rongshar Valley, 12,000 ft., 20.vi.1924 (*Maj. R. W. G. Hingston*), holotype ♀ ; Nyenyam, 12,500 ft., 16.vii.1921 (*A. F. R. Wollaston*), 1 ♀.

Docirava distata Prout

(Pl. 34 : E)

♂ 41 mm. Fore wing drab, the medial area rather darker and the costa very lightly irrorate with old rose ; antemedial fascia straight, cinnamon brown distally, warm buff proximally ; postmedial fascia slightly sinuous, cinnamon brown proximally, warm buff distally ; cell spot white ; underside with costa warm buff, subcostal area and distal part of radial veins old rose and the remainder of the wing drab. Hind wing cartridge buff with a clearly marked, drab medial fascia curved parallel to the termen ; underside cream colour densely irrorate with old rose, except at termen. Closely related to *D. affinis* Warren (1894) as is shown by the white cell spot and the course of the ante- and postmedial fasciae on the upperside of the fore wing and by the bright pink and drab underside of both wings ; differs in the fore wing by the browner ground colour, the greatly reduced pink irroration and by the cinnamon brown edging to the transverse fasciae. Differs in the hind wing by the better marked, curved medial fascia.

TIBET: Kama Valley, Saki-thung, 12,000 ft., 22.vi.1922 (*E. F. Norton*), holotype ♂.

Carsia emphracta Prout

(Pl. 34 : E)

♂ 34 mm. Near *Docirava postochrea* Hampson (1895) in size, shape and general pattern. Fore wing drab gray patterned with sayal brown to tawny olive; sub-basal fascia slender, excurved; antemedial less curved proximad at inner margin than in *D. postochrea*, broad at costa, tapered posteriorly and strongly toothed distad on median vein; postmedial fascia broader at apex than inner margin, sinuous and toothed distad between veins R_3 and M_1; terminal area irrorate with fuscous, densely and broadly between veins M_1 and R_1, whence this terminal shade narrows sharply to apex; cell spot elongate. Underside drab; cell spot as on upperside; costa bright clay colour, largely underlined with rose pink, broadening to reach the distal areole and vein R_1; distal margin suffused with rose pink in anterior half. Hind wing tilleul buff; underside rose pink with an ill-defined, postmedial fascia of bright clay colour.

BURMA: 28° 8′ N., 97° 24′ E., 1,000 ft., 29.vi.1926 (*F. Kingdon Ward*), holotype ♂.

Loxofidonia sigmata Prout

(Pl. 34 : G)

♂ 20-25 mm. Similar in size and pattern to *L. bareconia* Swinhoe (1894). In the male the fore wing differs in the suffusion of the costa and the space between the basal and medial areas with dark olive buff; the distal margin of the basal area is less sharply toothed in the cell and the medial area is divided and edged by fasciae of glossy plumbeous. The distal third of the wing, white in the male of *bareconia*, is irrorate with plumbeous. In the female the distal third of the fore wing and the whole of the hind wing is suffused with fuscous black.

W. CELEBES: Paloe, G. Tompoe, 2,700 ft., i.1937 (*J. P. A. Kalis*), holotype ♂; Koelawi Paloe, 3,100 ft., iii.1937 (*J. P. A. Kalis*), 2 ♂; Paloe, Loda, 4,000 ft., v.1937 (*J. P. A. Kalis*), 1 ♂: Tjamba, near Maros, 1,500 ft., ii.1938 (*J. P. A. Kalis*), 2 ♂, 1 ♀ allotype.

Loxofidonia sigmata lipernes Prout

♂ 22 mm. Differs from the nominate subspecies in the loss of the plumbeous fascia in the medial area. Proximad of the medial area the plumbeous irroration is replaced by dark olive buff.

DUTCH NEW GUINEA: Fak-Fak, 1,700 ft., xii.1907 (*Pratt*), holotype ♂.

Sterrhochaeta lamia Prout

(Pl. 36 : A)

Frons and head warm buff : thorax and abdomen cinnamon drab. Fore wing cinnamon drab, the veins and the cell area lightly irrorate with warm buff ; basal fascia, boldly bowed between costa and subcostal vein and between median and submedian veins, warm buff edged proximally with fuscous ; ante- and postmedial fasciae warm buff, the former edged proximally, the latter edged distally with fuscous anterior of the median vein ; posterior of this vein the medial area is narrowed by one half and uniformly fuscous ; subterminal fascia represented by longitudinal fuscous streaks between veins R_1 and R_2 and between R_3 and M_2 ; termen slenderly fuscous ; fringes warm buff proximally, mouse gray distally. Hind wing cartridge buff and glossy ; fringes irrorate with mouse gray. Related to S. *semiradiata* Warren (1907), but distinguished from it by the narrowed and uniformly fuscous posterior half of the medial area.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., i.1911 (*A. S. Meek*), 8 ♂, 4 ♀, including holotype and allotype.

PAPUA : Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), 2 ♀.

Sterrhochaeta rectilineata diffidens Prout

(Pl. 36 : A)

Differs from other races of *rectilineata* Warren (1898) in the suffusion of the posterior third of the fore wing, between veins R_1 and R_3, with russet and in having the hind wing uniformly cartridge buff.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., i-ii.1911 (*A. S. Meek*), 2 ♂, including holotype.

Sterrhochaeta rectilineata curvifera Prout

Distinguished from other races of *rectilineata* Warren (1898) by the colour and pattern of the fore wing ; the postmedial fascia is bowed distad between veins R_1 and R_3 ; the basal area is edged distally and the medial area is edged both proximally and distally with bright ferruginous ; distad of the medial area the wing is uniformly deep brownish drab.

NEW HANOVER : ii-iv.1923 (*A. S. Meek*), 3 ♀, including holotype.

Sterrhochaeta rectilineata indirecta subsp. n.

Distinguished from other races of *rectilineata* Warren (1898) by the suffusion of both wings with drab to wood brown ; as a result the pattern on the fore wing is ill-defined, the basal area being scarcely traceable and the hind wing has a uniformly smoky appearance.

W. CELEBES : Paloe, Sidaonta, 4,500 ft., vi.1937 (*J. P. A. Kalis*), holotype ♀.

Sterrhochaeta fulgurata mera Prout

Differs from *f. fulgurata* Warren (1906) in the straighter, white, transverse fasciae; the tooth at vein R_3 in the postmedial fascia of the fore wing of the nominate subspecies is wanting in this race.

BRITISH NEW GUINEA: Hydrographer Mts., 2,500 ft., i.1918 (*Eichhorn Bros.*), 5 ♀, including holotype.

Sterrhochaeta tanaorrhina Prout

(Pl. 36 : B)

♂ 25 mm. Face and thorax orange rufous, the latter with a longitudinal white streak in posterior half; head and abdomen cartridge buff irrorate with orange rufous. Fore wing cartridge buff irrorate with orange rufous and russet; basal and medial areas russet; basal fascia white edged proximally and distally with a few black scales; ante- and postmedial fasciae white, the former edged distally, the latter edged proximally with black; postmedial fascia strongly bulged distad between veins R_3 and M_2; subterminal fascia black and dentate, but poorly defined; there are two apical streaks of white. Hind wing cartridge buff, termen and fringes warm buff. Distinguished from other species in the genus by the shape of the postmedial fascia.

PAPUA: Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), holotype ♂.

Sterrhochaeta aphanisis Prout

(Pl. 36 : B)

♂ 21 mm. Fore wing maize yellow; basal and terminal areas densely irrorate with light grayish vinaceous; the antemedial fascia extends diagonally from one-third costa to two-thirds inner margin to fuse with the postmedial fascia, which extends directly from two-thirds costa; both fasciae are light grayish vinaceous; cell spot black; apex black with a little white irroration at the tip and two white spots on the proximal edge. Hind wing ivory yellow; postmedial fascia and terminal area very lightly irrorate with light grayish vinaceous. Distinguished at once from other species of *Sterrhochaeta* by the black apex to the fore wing.

CENTRAL DUTCH NEW GUINEA: Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

Sterrhochaeta leucosphena Prout

(Pl. 36 : C)

♂♀ 20 mm. Face, head, thorax and abdomen white or cartridge buff irrorate with fuscous, the abdomen also lightly irrorate with amber yellow. Fore wing white irrorate with fuscous; basal area densely fuscous, toothed distad in cell and submedian folds; medial area densely fuscous, proximal margin sinuous and deeply incised mediad in the cell and submedian folds, distal margin bulged boldly terminad between veins R_2 and M_2 ; a large, fuscous, costal spot is situate just before the apex and fuses with a similar terminal spot between veins R_1 and R_3 ; antemedial, postmedial and terminal fasciae slenderly amber yellow ; fringes chequered white and fuscous. Hind wing tilleul buff, very lightly irrorate with drab. As with most species of *Sterrhochaeta*, readily distinguished by colour and pattern.

PAPUA : Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), holotype ♂ and allotype ♀.

Sterrhochaeta biflexa Prout

(Pl. 36 : C)

♂♀ 16-19 mm. Fore wing light purple drab lightly irrorate with fuscous ; basal area more strongly fuscous, the distal margin edged with light buff ; medial area densely irrorate with fuscous, the proximal and distal margins sinuous and edged with light buff ; terminal area more or less irrorate with fuscous and with a broad, light buff streak on vein R_1 ; a slender, dentate, light buff subterminal fascia is present in some examples ; cell spot black ; termen fuscous between the veins ; fringes light buff proximally, fuscous distally. Hind wing weakly and uniformly light purple drab ; cell spot and postmedial fascia faintly fuscous. The colour, the pattern and especially the broad, pale streak on vein R_1 on the fore wing serve to distinguish this species from the closely related *S. lineola* Warren (1903).

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*) holotype ♂ and allotype ♀.

BRITISH NEW GUINEA : Hydrographer Mts., 2,500 ft., iv.1918 (*Eichhorn Bros.*), 1 ♀ ; Biagi, Mambare R., 5,000 ft., iii.1906 (*A. S. Meek*), 1 ♀.

Desmoclystia abata Prout

(Pl. 36 : D)

♀ 22 mm. The male is unknown but the species probably belongs to the *unipuncta* Warren (1906) section of the genus ; the fore wing has more definite reddish bands than in that species ; there is some white in the basal area and a broad, irregularly shaped, white, medial area ; postmedial fascia slender and white, differently shaped from that of *unipuncta* ; subterminal fascia interrupted at the veins, but without a conspicuously large, white spot between veins R_3 and M_1 as in *unipuncta* ; fringes reddish proximally, chequered white and fuscous distally. Hind wing drab, fringes reddish.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., i.1911 (*A. S. Meek*), holotype ♀.

Desmoclystia abbreviata Prout

(Pl. 36 : E)

♂♀ 12 mm. Palpus, frons, head and thorax black ; collar and abdomen dark olive buff. Fore wing : basal and terminal fifths fuscous, the latter area tapering tornad ; medial area fuscous, broad at costa, interrupted in cell area, narrowing and failing at submedian fold ; remainder of wing dark olive buff. Hind wing drab. Related to *D. nigribasis* Warren (1906), but distinguished by its very small size, the colour and pattern of the fore wing and the uniformly dark hind wing.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

BRITISH NEW GUINEA : Hydrographer Mts., 2,500 ft., i.1918 (*Eichhorn Bros.*), allotype ♀.

Desmoclystia oniria Prout

(Pl. 36 : F)

♂ 20-22 mm. ; ♀ 25 mm. Cilia of male antenna equal in length to one-third of the diameter of the shaft ; those of the female minute. Frons, thorax and abdomen russet suffused with fuscous ; head russet. Fore wing tawny to russet crossed by many slender, glossy fasciae, each fascia smoke gray lightly irrorate with black and white ; subterminal fascia black and dentate, enlarged into spots between the veins and edged distally with white ; cell spot slender and oblique, russet ; fringes white proximally, russet distally. Hind wing uniformly drab ; fringes cinnamon buff. Distinguished from other species in the genus by the glossy pattern of the fore wing.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., i-ii.1911 (*A. S. Meek*), 4 ♂, 1 ♀, including holotype and allotype.

Desmoclystia aypna Prout

(Pl. 36 : F)

♂ 24 mm. ; ♀ 28 mm. Male antenna subdentate with fascicles of cilia twice as long as the diameter of the shaft ; female antenna minutely ciliate. Fore wing tawny more or less irrorate with white ; basal fourth russet irrorate with fuscous ; medial area acutely angled on vein R_3 and composed of many slender fasciae of fuscous, russet and white ; termen with interneural, fuscous spots or streaks edged proximally with white, larger in anterior half of wing ; cell spot fuscous ringed with tawny ; fringes tawny proximally, chequered white and russet distally with fuscous spots at the vein ends. Hind wing tilleul buff irrorate with fuscous ; fringes cinnamon buff. Related to *D. oniria*, but differing in its larger size, more clearly defined basal and medial areas, paler hind wing and the structure of the male antennae.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., i-ii.1911 (*A. S. Meek*), 1 ♂, 2 ♀, including holotype and allotype.

Chaetolopha tafa Prout

(Pl. 36 : H)

♂ 20-22 mm. Palpus, frons, head, thorax and abdomen light buff irrorate with warm sepia. Fore wing : basal area, bowed distally, warm sepia ; medial area, tapered posteriorly, with proximal margin slightly toothed basad on median vein and distal margin incised mediad between veins R_1 and R_3 and lunulate, strongly between veins R_3 and M_1 and between M_1 and M_2, warm sepia with two light buff flecks at costa ; distal fourth of wing warm sepia divided by the white, subterminal fascia ; an apical streak, white irrorate medially with light orange yellow, extends diagonally almost to the postmedial fascia ; a lateral streak, between veins R_3 and M_1, extends from the termen almost to the postmedial fascia ; antemedial fascia light buff irrorate with light orange yellow, narrowed medially and with a spot of warm sepia medially at the costa and at the inner margin ; postmedial fascia white irrorate distally with light orange yellow ; fringes chequered warm sepia and white. Hind wing white irrorate with drab ; postmedial fascia broad and curved parallel to the termen, subterminal fascia punctiform, both pale and ill-defined ; fringes as on fore wing. Related to *C. ornatipennis* Warren (1906), but differing in the darker colour of the basal, medial and terminal areas, the almost complete suppression of pale irroration and spotting in the medial area and the reduction of the yellow colouring on the fore wing.

PAPUA : Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), 2 ♂, including holotype.

Chaetolopha turbinata Prout

(Pl. 36 : H)

♂ 19-20 mm. ; ♀ 22-23 mm. Palpus, frons and thorax light orange yellow irrorate with ochraceous orange ; tegulae warm sepia ; first abdominal segment light orange yellow, remainder of abdomen ochraceous orange, each segment edged posteriorly with white and irrorate laterally with warm sepia. Fore wing patterned similarly to the preceding species ; the subcostal area, between the base of the wing and the postmedial fascia, is densely irrorate with ochraceous orange ; the antemedial fascia thus commences at the subcostal vein and its medial spot at the inner margin is ochraceous orange instead of warm sepia ; distal margin of the medial area very gently and evenly lunulate for its entire length ; the distal half of the postmedial fascia is ochraceous orange and the subterminal fascia is edged distally with the same colour. The hind wing is densely irrorate with fuscous, the termen lightly irrorate with ochraceous orange in some examples ; postmedial fascia very slender, parallel to the termen and weakly defined. Fringes on both wings fuscous with a little white scaling distally between the veins.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., ii-iii.1911 (*A. S. Meek*), 3 ♂, 3 ♀, including holotype and allotype.

Chaetolopha ornatipennis nepenthes Prout

(Pl. 36 : K)

♀ 25 mm. Rather larger and much paler than *o. ornatipennis* Warren (1906) ; palpus, frons, head, thorax and abdomen white densely irrorate with warm buff, the abdominal segments white posteriorly. On the fore wing the basal area shades from straw yellow at the base of the wing, through ochraceous orange to warm sepia at its distal margin ; the terminal third of the wing is similarly coloured ; the medial area is reduced and encloses a large, white cell spot ; the antemedial fascia is broad and straw yellow and is edged slenderly both proximally and distally with white ; the postmedial fascia, also broad and straw yellow, is edged proximally with white. Hind wing light buff suffused with drab ; postmedial fascia broad and faintly indicated by a light straw yellow and ochraceous orange suffusion.

NEW IRELAND : xi.1923 (*A. F. Eichhorn*), holotype ♀.

Chaetolopha ornatipennis anomala Prout

♀ 23 mm. Differs from the closely related *ornatipennis peregrina* Prout (1929) in the fore wing, in the greater admixture of ochraceous orange in the basal, medial and terminal areas, in the better marked white, subterminal fascia and in the fringes, which are chequered white and fuscous. The hind wing is paler with a broad, though ill-defined postmedial fascia.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., i.1911 (*A. S. Meek*), holotype ♀.

Propithex glaucisparsa scintillulata Prout

Differs from *g. glaucisparsa* Prout (1932) in the amount and in the distribution of the iridescent gray-blue scales on the fore wing. The antemedial band is edged proximally and the postmedial band is edged distally with a double, lunulate fascia of iridescent gray-blue scales ; the single, lunulate, subterminal fascia and apical streak are similarly coloured ; the iridescent gray-blue irroration of the apex and terminal areas of the nominate subspecies is wanting and that of the medial area is confined to the anterior fourth.

MALAYA : Selangor, Bukit Kutu, 3,300 ft., 27.ix.1932 (*H. M. Pendlebury*), holotype ♂ ; Pahang, Fraser's Hill, 4,000 ft., 28.1.1929 (*H. M. Pendlebury*), 1 ♀ ; Pahang, Cameron Highlands, 8,800 ft., 24.vi.1935 (*H. M. Pendlebury*), allotype ♀.

Carbia calefacta Prout

(Pl. 36 : K)

Carbia calescens Walker Prout *nec* Walker, 1932, *J. F.M.S.*, **17** : 60.

♀ 20-24 mm. Generally smaller than *C. calescens* Walker (1866), which is closely related. The fore wing is not quite so broad and the termen is less strongly rounded ; the distal half is suffused with ochraceous orange ; the white ante- and postmedial fasciae are broader and more closely approximate ; the subterminal fascia in *calescens* is lunulate ; in *calefacta* the proximal edge is straight from the costa to vein M_1 and the black marking proximad of it is cut by the ochraceous orange radial veins ; in *calescens* the black marking is entire. In both species the hind wing is ochraceous orange with a fuscous anal margin marked in light buff with the beginnings of the transverse fasciae.

North Borneo : Mt. Kinabalu, Marei Parei, 5,000 ft., 30.iv.1929 (*H. M. Pendlebury*), holotype ♀ ; Serambi, xii.1908 (*R. Shalford*), 1 ♀.

Sarawak : Kuching, 6.xi.1900 (*R. Shalford*), 1 ♀.

Singapore : (*H. N. Ridley*), 1 ♀.

Pulo Laut : (*Doherty*), 1 ♀.

Pomasia parerga Prout

(Pl. 36 : K)

Very similar in size and pattern to *P. denticlathrata* Warren (1893), but differs on the upperside of the fore wing, which has the distal third suffused with ochraceous buff. The underside of both wings is uniformly ochraceous orange, distinguishing the species at a glance from its allies.

India : Khasia Hills, xi.1894 (*Native coll.*), holotype ♂ ; *ibid.*, vii.1894, 1 ♂ ; *ibid.*, without date, 4 ♂, 4 ♀ ; *ibid.*, (*Nissary*), 1 ♀ ; Assam, Digboi (*L. Brunt*), 1 ♀ ; Cherrapunji, 1 ♂ ; *ibid.*, ix.1893, 1 ♀.

Bhutan : 1 ♀.

S. Shan States : Kalaur, 4,000 ft., 1 ♂.

Eccymatoge callizona (Lower) ab. ***abiens*** Prout

(Pl. 37 : A)

Hydriomena brujata Guenée Meyrick *nec* Guenée, 1891, *Proc. Linn. Soc. N.S.W.* (2) **5** : 855.

Differs from typical *callizona* Lower (1984) in the loss of the cartridge buff colouring from the first abdominal segment and from the basal and terminal areas of the fore wing. The cartridge buff, subterminal, interneural spots on both wings remain, that between veins R_3 and M_1 on each wing being larger than the others, especially so on the fore wing.

Australia : Queensland (*ex. coll. Swinhoe*), holotype ♀ ; Victoria (*E. Anderson*), 1 ♀ ; sine loc. (*E. Anderson*), 1 ♂.

Collix adamata Prout

(Pl. 37 : A)

♀ 39 mm. Palpus warm buff irrorate with bister. Frons, head, thorax and abdomen bister. Fore wing bister ; costa irrorate with warm buff, especially distad of the postmedial fascia, which is rather darker than the ground colour and very faintly marked, principally on the veins ; distad of the postmedial fascia the veins are marked each with a pair of warm buff spots ; subterminal fascia warm buff at costa, then marked as cartridge buff, interneural spots ; terminal spots at the vein ends also cartridge buff. Hind wing similarly marked, except for the warm buff costal irroration, which is wanting. Cell spots on both wings fuscous ringed with cartridge buff. Related to *C. suffusca* Warren (1907), from which it differs in its larger size, lack of vinaceous sheen and in the bister irroration of the palpus.

S. W. Celebes : G. Lampobattang, Parang-bobo Goa, 5,000 ft., v.1938 (*J. P. A. Kalis*) holotype ♀.

Collix rhabdoneura Prout

(Pl. 37 : C)

♂ 32 mm. Antenna very minutely ciliate. Palpus one and one-half times as long as the diameter of the eye. Palpus, frons, and thorax cartridge buff densely irrorate with bister; abdomen similar, but also irrorate with cinnamon. Fore wing bister; costal region mottled with cinnamon, the beginnings of the transverse fasciae marked in black; terminal area bister divided by the white, punctiform, subterminal fascia; between the level of the *DC* and the bister terminal area, the veins are cinnamon and there is some cinnamon mottling between veins Sc_5 and M_1; cell mark small, almost confined to the *DC*. Hind wing similar, except that the costal markings are wanting. Similar in size to *C. ghosha* Walker (1862), but differing in the bright cinnamon mottling and marking of the veins.

MALAYA : Pahang, Cameron Highlands, 4-5,000 ft., 10.vi.1935 (*H. M. Pendlebury*), holotype ♂.

Collix ghosha mayri Prout

Differs from *g. ghosha* Walker (1862) in having the upperside of the wings dark and weakly marked, as in only rare aberrations of the nominate subspecies in Ceylon and India.

NEW GUINEA : Arfak, Mt. Siwi, 800 m., iv-vi.1928 (*Dr. E. Mayr*), 3 ♂, including holotype.

Collix dichobathra puncticulata Prout

Differs from *d. dichobathra* Prout (1931) in the warmer, brown instead of gray ground colour of the wings; in *d. dichobathra* the ground colour is drab to drab-gray; in *d. puncticulata* it is bright pinkish cinnamon and the pattern is rather spottily marked, recalling *C. multifilata* Warren (1896).

AUSTRALIA : Queensland, Kuranda, 1907 (*Dodd*), 2 ♂, 1 ♀, including holotype and allotype; *ibid.*, 1910, 3 ♀; *ibid.*, 1911, 2 ♀; *ibid.*, 1913, 1 ♂; Cairns Dist. (*F. P. Dodd*), 2 ♂.

Collix dichobathra puncticulata f. ***anaxia*** Prout

Distad of the clearly marked, double, dentate antemedial fascia both wings are lightly but evenly irrorate with drab; the postmedial fascia is slender and bister; distad of and parallel to it there is a broad, pale fascia; all other pattern is suppressed.

AUSTRALIA : Brisbane (*M. Culpin*), holotype ♀; Brisbane, 1900 (*A. J. Turner*), 1 ♂; Brisbane, Taylor Range (*F. P. Dodd*), 1 ♀.

Exodezia gen. n.

Frons with small, pointed cone below. Palpus two and one-half times as long as the diameter of the eye, second segment rough-scaled. Tongue developed. Male antenna almost simple, laterally compressed. Pectus scarcely hairy. Femur glabrous. Fore wing slightly less long-winged than in most *Collix*; costa rounded near apex, termen smooth; cell less than one-half as long as wing, rather longer posteriorly; *DC* very oblique; areole double, the distal one long; vein Sc_1 from areole, Sc_{2-4} stalked, Sc_5 from areole; R_1 from upper angle of cell, R_2 from middle of *DC*, R_3 and M_1 closely approximate. Hind wing weakly *Collix*-shaped; cell less than one-half as long as wing; *DC* curved to become oblique posteriorly; *C* anastomosed to close to end of cell; Sc_2 and R_1 stalked, R_2 from anterior of middle of *DC*, R_3 and M_1 closely approximate. The genitalia show a close relationship to those of the type species of *Collix*, *C. ghosha* Walker (1862). Differs from that genus chiefly in coloration and pattern, the less dentate hind wing and the closer approximation of veins R_3 and M_1.

Type species: *Eulype albifusa* Swinhoe (1904).

Horisme brooksi Prout

(Pl. 37 : F)

♂ 22 mm. Frons and head bister. Thorax and abdomen white, the latter lightly irrorate with bister. Fore wing light buff irrorate with a few scattered, bister scales; basal fourth of costa bister; ante- and postmedial fasciae bister, broadly and heavily marked at costa, very faintly marked at inner margin and failing completely medially; terminal fourth of wing russet and bister, the russet being more brightly marked proximad of the slender, pale buff, subterminal fascia, which divides this area; cell spot weakly marked, bister. Hind wing pale buff lightly irrorate with bister; basal fascia broad, postmedial slender, both bister and ill-defined; terminal fourth marked as on fore wing, except that the proximal part is broader and bright russet in the anterior and posterior thirds, failing medially; the terminal part is slender and less broken medially; cell spot large, ovate and bister. Underside of both wings white; antemedial fascia and termen of fore wing, postmedial and subterminal fasciae on both wings evenly and smoothly fuscous; cell spots fuscous; subcostal, median and submedian veins and veins Sc_5, R_1, M_1 and M_2 on the fore wing broadly yellow ocher; hind wing, except submedian vein, similarly marked. Similar in underside pattern and colour to *H. flavovenata* Leech (1897) and to *Echthrocollix minuta* Butler (1881), but distinguished by the colour and pattern of the upperside of the wings; similar in the pattern and colour of the upperside of the wings to *H. rufipicta* Hampson (1895), but distinguished by the brightly coloured underside.

SUMATRA: Dempo, 4,000 ft., viii.1923 (*C. J. Brooks*), holotype ♂.

Horisme hyperythra catalalia Prout

The upperside of both wings differs from *h. hyperythra* Hampson (1897) in the darker, less reddish colour; the underside differs in the acute angling of the postmedial fascia on vein R_1 on the hind wing and in the paler ground colour of both wings.

FORMOSA: Rantaizan, 10.v.1909 (*A. E. Wileman*), holotype ♂; *ibid.*, 15.v.1909, 1 ♀; *ibid.*, v.1909, 1 ♂; *ibid.*, iv.1906, 1 ♂; *ibid.*, 7,500 ft., 9.v.1909, 1 ♂; Kanshirei, 27.iv.1908 (*A. E. Wileman*), 1 ♂; *ibid.*, 1,000 ft., 19.iv.1906, 1 ♂.

Horisme erythroides Prout

(Pl. 37 : G)

♂ 38 mm. Palpus, head and frons pinkish buff with a few scattered fuscous scales. Thorax and abdomen pinkish buff irrorate with fuscous and lightly with vinaceous tawny. Fore wing pinkish buff densely irrorate with fuscous and vinaceous tawny, except just distad of the *DC*, at three-quarters of the wing between the costa and vein R_1 and terminally at the apex, tornus and between veins R_3 and M_1. Hind wing : costa tilleul buff, anal margin warm buff, remainder of wing pinkish buff evenly irrorate with fuscous and vinaceous tawny ; basal, antemedial and subterminal fasciae double, postmedial fascia single, all slender and fuscous. Underside of both wings tilleul buff evenly irrorate with drab ; postmedial and subterminal fasciae faintly marked with more densely irrorate drab ; costa of fore wing warm buff. Similar in size and elongate wing-shape to *H. hirtivena* Warren (1906), but readily distinguished from that species by its distinctive pattern.

Papua : Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), holotype ♂.

Horisme invicta Prout

♀ 35-38 mm. Although the male is unknown, the position of the species is evidently close to *H. hyperythra* Hampson (1897) ; it is larger than the largest specimens of that species, the fore wing is relatively broader, the hind wing more crenulate, thus nearer to *H. boarmiata* Snellen (1881), which it further resembles in the much less bent postmedial fascia, particularly noticeable on the strongly marked underside, where however it does not arise from a darker costal spot as in *boarmiata*. Ground colour of both wings dark olive buff lightly irrorate with vinaceous cinnamon ; the pattern is almost exactly as in *hyperythra*, that of the fore wing being marked in bister and that of the hind wing in vinaceous cinnamon. The hind wing is even more suffused with vinaceous cinnamon than in *hyperythra* and the characteristic course of the broad and strongly marked postmedial fascia of that species is closely followed, though there is a very faint additional indentation at vein R_2. Underside of both wings vinaceous cinnamon ; cell spot and postmedial fascia on both fore and hind wing fuscous.

W. Sumatra : Korinchi, 7,300 ft., v.1914 (*Robinson & Kloss*), 2 ♀, including holotype.

Horisme boarmiata serangica Prout

♂ 38 mm.; ♀ 39 mm. Larger than *b. boarmiata* Snellen (1881), which has a wing-span of 28-34 mm. The white markings on the patagia, the first abdominal segment and the wings of the nominate subspecies are warm buff in *serangica*.

Central Ceram : Manusela, 6,000 ft., x-xii.1919 (*C. F. & J. Pratt*), holotype ♂ and allotype ♀.

Horisme semirufata goliathi Prout

Differs from *s. semirufata* Warren (1906) in the more direct, lunulate, postmedial fascia on the fore wing ; it extends directly from Sc_5 to six-sevenths inner margin, is boldly lunulate and toothed strongly and sharply proximad on the veins between the lunules ; in the nominate subspecies the postmedial fascia is weakly lunulate between veins R_3 and M_2, thence extends directly to five-sevenths inner margin, being weakly toothed proximad on the submedian vein only.

Central Dutch New Guinea : Mt. Goliath, 5-7,000 ft., about 139° long., i-ii.1911 (*A. S. Meek*), 1 ♂ 2 ♀, including holotype and allotype.

Horisme steretica Prout

(Pl. 37 : I)

♂ 34-36 mm. Frons, head, thorax and abdomen buff pink irrorate with testaceous. Fore wing buff pink suffused with testaceous, especially between the basal and antemedial fasciae and in the terminal sixth ; costa and subcostal area lightly irrorate with fuscous ; antemedial fascia acutely angled in the cell area, warm buff slenderly edged both proximally and distally with maroon ; postmedial fascia, similarly composed, gently lunulate from costa to vein R_3 incurved and then almost straight from M_1 to the inner margin ; several very slender, warm buff fasciae cross the medial area, with a conspicuous, warm buff spot at the junction of veins R_3 and M_1 ; subterminal fascia white and punctiform, the spot between veins R_3 and M_1 being very large ; terminal spots at the vein ends warm buff, those on R_3, M_1 and the submedian vein extending broadly across the terminal area. Hind wing tilleul buff in costal third, termen and posterior two-thirds irrorate, densely towards margins, with testaceous ; ante- and postmedial fasciae buff pink edged anteriorly and posteriorly with maroon and black, weakly marked and failing costad ; subterminal fascia white and punctiform ; terminal spots at the vein ends warm buff and of equal size. In one specimen the medial area of the fore wing is edged broadly and the centre irrorate with black, posterior of the discal fold. Related to *H. semirufata* Warren (1906), but distinguished by its large size, its almost uniformly warm pink colour and by the presence of entire ante- and postmedial fasciae.

Central Dutch New Guinea : Mt. Goliath, 5-7,000 ft., about 139° long., i-ii.1911 (*A. S. Meek*), 5 ♂, including holotype.

Horisme anguligera (Butler) ab. ***bipartita*** Prout

(Pl. 37 : K)

Fore wing : anterior of a line from the apex to two-sevenths of the inner margin the wing is light buff, lightly irrorate with fuscous along the costa ; posterior of it the wing is drab irrorate with fuscous, the light buff, postmedial fascia being marked only between veins R_3 and M_1 and at the inner margin. Hind wing : costa and postmedial fascia broadly, subterminal fascia slenderly light buff ; remainder of wing drab irrorate with fuscous and transversed by several slender, fuscous fasciae.

New Zealand : Wellington, 4 ♂, including holotype ; Arthurs Pass, 1 ♂.

Horisme labeculata deviaria Prout

Differs from *l. labeculata* Prout (1932) in the course of the dentate antemedial fascia on the fore wing, which is angled distad on the discal and submedian folds and proximad on the median vein ; in the nominate subspecies this fascia forms an almost regular curve. Differs also in the hind wing, which has a broad, drab, terminal band.

Papua : Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), 3 ♂, 4 ♀, including holotype and allotype.

Parazoma semifusca swanni Prout

(Pl. 38 : D)

Differs from *s. semifusca* Warren (1896) in colour and pattern ; on the fore wing the ground colour is less irrorate with fuscous, resulting in the sharp definition of the basal and medial areas ; the subterminal band, which in the nominate subspecies extends broadly from the costa almost to vein R_3, is in *swanni* cut by a broad streak of the ground colour along vein R_1. On the hind wing the broad, fuscous terminal band of the nominate subspecies is wanting.

Burma : Htawgaw, iii.1923 (*A. E. Swann*), 2 ♂ including holotype.

Physetobasis dentifascia kachinica subsp. n.

♂ 25 mm. Smaller than *d. dentifascia* Hampson (1895), which has a wing span of 29-30 mm.; also darker, both wings are more densely suffused with bister, resulting in the subterminal fascia on the fore wing becoming but faintly discernable.

NE. Burma : Htawgaw, 6,000 ft., vii.1923 (*A. E. Swann*), holotype ♂.

Physetobasis dentifascia rectipendens subsp. n.

(Pl. 38 : E)

♂ 28 mm. Rather a pale race ; ground colour of both wings light drab ; basal and terminal areas suffused with drab. On the fore wing the medial fascia is drab ; basal, ante- and postmedial fasciae black, the antemedial edged proximally and the basal and postmedial fasciae edged distally with white ; basal fascia broken between median vein and vein SM_2 ; antemedial marked from costa to vein SC and then as three spots, one each on the median vein, vein SM_2 and at the inner margin ; postmedial fascia broad from costa to vein Sc_5, then slender to M_1, being toothed proximad along the radial veins ; cell spot ovate and black, slenderly margined with white. Hind wing light drab, a little paler costad ; postmedial fascia black, toothed proximad on the veins and edged slenderly with white distally ; cell spot elongate and fuscous. Subterminal fascia on both wings white and faintly marked.

Lower Burma : v.1914 (*F. M. Mackwood*), holotype ♂.

Physetobasis dentifascia kiunkiangana subsp. n.

♀ 29 mm. Ground colour and colour of pattern on both wings similar to that of the preceding subspecies. On the fore wing the basal fascia is broader costad ; the antemedial fascia inclines towards the point where vein M_2 meets the termen, is acutely angled in the discal fold and then fails ; postmedial fascia almost straight from costa to vein R_3, then fails, apart from a spot on vein M_1 ; cell spot ovate and parallel to the antemedial fascia ; anterior third of medial area densely irrorate with black.

CHINA : Kiunkiang, vi.1887 (*A. E. Pratt*), holotype ♀.

Eupithecia raniata sp. n.

(Pl. 38 : F)

♂♀ 19-23 mm. Cilia of male antennae a little longer than one-half of the diameter of the shaft. Smaller and much darker than *E. rajata* Guenée (1858), which it resembles in structure ; more glossy, the dark costal spots less developed ; transverse fasciae, except subterminal, almost obsolete ; subterminal fascia white, irregular and variable in strength of marking, its strongest angles near costa, its dot close to the tornus cleanly white, though not, or scarcely, enlarged. Eighth sternum weakly sclerotized, consisting of two gently tapered arms, which incline towards each other for half of their length, then become parallel in the apical half.

INDIA : Darjeeling, viii.1904, 1 ♂, 4 ♀, including holotype and allotype.

Eupithecia circumacta sp. n.

(Pl. 38 : H)

♀ 22 mm. Frons, head, thorax and abdomen fuscous irrorate with pale smoke gray. Fore wing fuscous patterned with pale smoke gray ; basal fascia single and broad ; antemedial and medial fasciae double, acutely angled in the discal fold, then straight to the inner margin ; postmedial fascia straight from costa to vein Sc_5, then inclined terminad, acutely toothed on vein R_1, thence straight to the inner margin ; subterminal fascia very slender and dentate ; cell spot a large tuft of fuscous scales ; in one example the lower angle of the cell is marked with a spot of ochraceous tawny. Hind wing tilleul buff at costa ; remainder irrorate with fuscous ; cell spot and postmedial fascia of ground colour. Eighth sternum consists of two slender, parallel arms, each tapered apicad. Similar in size, colour and pattern to *E. nuceistriga* Bastelberger (1911) from Formosa, but lacking the interrupted terminal area and the ochraceous tawny veins in the distal half of the fore wing of that species.

INDIA : Darjeeling, viii.1904, 4 ♀, including holotype ; Sikkim, Tendong, 8,000 ft., 1.viii.1886 (*H. J. Elwes*), 1 ♀ ; Sikkim (*H. J. Elwes*), 1 ♀ ; Sikkim, 29.ix.1889 (*J. G. Pilcher*), 1 ♀.

Eupithecia albibaltea sp. n.

(Pl. 38 : H)

Similar in size, colour and pattern to *E. tricrossa* Prout (1926), but distinguished from it by the presence of a slender, light buff band on the anterior edge of the first abdominal segment and by the antemedial fascia, which is slender from the costa to the cell fold, then acutely angled and much broadened to extend to three-quarters of the inner margin ; the posterior part of this fascia appears at first glance to be a broad, diagonal fascia extending from the cell spot almost to the base of the wing ; the postmedial fascia is usually broad and single instead of slenderly double, as in *tricrossa*.

India : Darjeeling, vii.1886 (*H. J. Elwes*), holotype ♂ ; *ibid.* (*Dr. Lidderdale*), 1 ♂, 1 ♀ ; Sikkim, 5,000 ft., vii.1886 (*H. J. Elwes*), 2 ♀ ; Sikkim, 7,000 ft., vii-viii.1895 (*J. G. Pilcher*), 2 ♀.

Eupithecia pyricoetes sp. n.

(Pl. 38 : H)

♂♀ 20-21 mm. Frons, head, thorax and abdomen fuscous irrorate with smoke gray. Fore wing fuscous ; basal and antemedial fasciae broad, tilleul buff and lightly irrorate with pale smoke gray ; sometimes the two fasciae are fused into a broad band ; postmedial fascia double, the proximal line slender, the distal one broad, tilleul buff irrorate with pale smoke gray ; medial area fuscous, the radial and medial veins burnt sienna ; medial fascia sinuous and weakly marked ; distad of the postmedial fascia the wing is fuscous and divided by a slender, dentate, pale smoke gray subterminal fascia ; there is some pale smoke gray irroration between the subcostal and median veins ; cell spot large, tufted and fuscous. Hind wing tilleul buff costally ; remainder of wing irrorate with fuscous ; cell spot small and fuscous, weakly marked. Eighth sternum narrowed to one-half posteriorly and bilobate at apex. A little larger than *E. tricrossa* Prout (1926) and distinguished from it by the broad, pale margins to the almost uniformly fuscous medial band with its burnt sienna radial and medial veins.

India : Sikkim (*H. J. Elwes*), holotype ♂ ; *ibid.*, 7,000 ft., 1889 (*O. Möller*), 1 ♀ ; *ibid.*, ix.1909 (*F. Moller*), 1 ♂ ; *ibid.*, 7,000 ft., vii.1895 (*Pilcher*), 1 ♂.

Eupithecia peguensis sp. n.

(Pl. 38 : I)

♀ 25-27 mm. Frons, head, thorax and abdomen cinnamon buff lightly irrorate with light drab. Fore wing cinnamon buff ; postmedial fascia extends diagonally from costa to vein Sc_5, straight to R_1, parallel to termen to M_2, then sinuous to inner margin, broadly light buff, slenderly divided and edged both proximally and distally with fuscous ; subterminal fascia minutely punctiform, fuscous proximally and white distally ; cell spot large, fuscous and tufted ; a broad, drab shade extends diagonally from the terminal fourth of the costa to the second fifth of the inner margin ; basal fifth of costa also drab. Hind wing tilleul buff, termen and anal margin broadly cinnamon buff, the latter irrorate with fuscous. Similar in size and wing shape to *E. albispumata* Warren (1893), but distinguished from it by the pattern and colour of the wings.

Burma : East Pegu, 4-5,000 ft., iii-iv.1890 (*W. Doherty*), 3 ♀, including holotype.
Upper Tonkin : Prov. Laokay, Muong-Khuong, 900-1,000 m., 1 ♀.

Eupithecia albigutta sp. n.

(Pl. 38 : K)

♀ 23 mm. Palpus bister and twice as long as the diameter of the eye. Frons and head white. Thorax light buff, the tegulae tipped with white. Abdomen light buff irrorate with bister and black. Fore wing cinnamon brown irrorate with bister proximad of the postmedial fascia ; a large white spot is situate at the base of the wing, posterior of subcostal vein ; basal and antemedial fasciae white, marked only weakly at costa, submedian fold and at the inner margin ; medial fascia double, marked only between costa and median vein and at the inner margin, the distal line slender, the proximal broad and greatly enlarged in the cell area and enclosing the tufted, bister cell spot ; postmedial fascia double, weakly marked between costa and vein R_1 and at inner margin only ; subterminal fascia punctiform, white edged distally with black, marked clearly only between veins R_3 and M_1 and in the submedian fold. Hind wing tilleul buff ; termen cinnamon brown, broadly at costa, tapering towards anal angle ; anal margin with three patches of bister, one at base, one medially and one near anal angle ; veins light buff in distal half of wing. Rather similar in general appearance to *E. dolia* West (1929) from the Philippine Islands, but smaller and with a darker hind wing ; on the fore wing the clearly defined medial area and subterminal fascia of that species is lacking and the proximal two-thirds is irrorate with bister.

INDIA : Simla, 7,000 ft., x.1897 (*Pilcher*), holotype ♀.

Eupithecia fulcrata sp. n.

(Pl. 38 : K)

Eupithecia ustata Moore Prout *nec* Moore, 1926, *J. Bombay nat. Hist. Soc.*, **31** : 319.

♂ 21 mm. Palpus bister, one and three-quarter times as long as the diameter of the eye. Frons, head, thorax and first abdominal segment white ; remainder of abdomen white irrorate with cinnamon brown. Fore wing cinnamon brown, a little darker, inclined to russet, proximad of the postmedial fascia ; costa broadly bister in this part of the wing. Antemedial, medial and postmedial fasciae broadly white at costa, then merging into the white area occupying the distal half of the cell area ; the antemedial continues posteriorly to join the second white area occupying the proximal half of the wing, posterior of the median vein ; subterminal fascia punctiform and fuscous, edged distally with white ; cell spot elongate and fuscous. Hind wing white, very lightly irrorate with cinnamon brown along the termen and a little more densely along the anal margin. Differs from *E. ustata* Moore (1888) in the longer palpus (in *ustata* it is equal to the diameter of the eye) ; in the fore wing, with its paler, warmer brown colour and more extensive, though blurred, white pattern and in the whiter, less irrorate hind wing.

NE. BURMA : Htawgaw, 6,000 ft., iv-v.1923 (*A. E. Swann*), holotype ♂.

Eupithecia mundiscripta commundata subsp. n.

Differs from *m. mundiscripta* Warren (1907) in the warmer brown, distal third and the darker, proximal two-thirds of the fore wing ; distad of the postmedial fascia the drab irroration is reduced and the ochraceous tawny ground colour predominates ; proximad of the postmedial fascia the wing is evenly irrorate with fuscous.

North Borneo : Mt. Kinabalu, v-viii.1903 (*John Waterstradt*), 6 ♀, including holotype.

Eupithecia mundiscripta larutensis subsp. n.

On the fore wing the ochraceous tawny ground colour is pronounced in the distal half ; the proximal half is white lightly irrorate with fuscous ; the costa is densely irrorate with fuscous, but only to just proximad of the level of the cell spot.

Malaya : Perak, Larut Hills, 3,700 ft., 13.ii.1932 (*H. M. Pendlebury*), holotype ♀.

Eupithecia excita sp. n.

(Pl. 39 : A)

♂ 16 mm. Antenna ciliate, the cilia three times as long as the diameter of the shaft. Palpus, frons, head, thorax and abdomen light buff, the abdomen irrorate with fuscous laterally. Fore wing light buff irrorate with cinnamon buff ; costa fuscous in basal fifth and just before apex ; medial area irrorate with fuscous and a little russet, and edged both proximally and distally with white ; distal fifth of wing, posterior of vein R_1, fuscous divided by a straight, white, subterminal fascia ; cell spot wanting. Hind wing : proximal half with distal edge sinuous, fuscous ; distal half white irrorate with fuscous anteriorly and cinnamon buff posteriorly ; termen straight from subcostal vein to vein M_2, then crenulate to anal angle. Related to *E. melanolopha* Swinhoe (1895), but differing in the longer cilia of the male antennae, the shape of the medial area and the absence of the cell spot on the fore wing and the absence of the large, russet spot at seven-eighths anal margin of the hind wing, so conspicuous in that species.

SW. Celebes : Tjamba, Near Maros, 1,500 ft., ii.1938 (*J. P. A. Kalis*), holotype ♂.

Eupithecia wardi sp. n.

(Pl. 39 : A)

♂ 30 mm. Antenna ciliate, the cilia equal in length to one-half the diameter of the shaft ; palpus a little longer than the diameter of the eye. Head pinkish buff. Palpus, frons, thorax and abdomen pinkish buff irrorate with bister. Fore wing pinkish buff lightly suffused with pinkish cinnamon ; medial area irrorate with white ; veins marked with bister dashes ; subterminal fascia white and punctiform ; remaining transverse fasciae bister and faintly marked, broadly at costa, then slenderly to inner margin ; basal fascia acutely angled on subcostal vein ; antemedial, medial and postmedial fasciae acutely angled on subcostal and on vein R_1 ; cell spot elongate and fuscous. Hind wing tilleul buff, the termen and anal margin lightly irrorate with bister ; transverse fasciae very faintly marked. The eighth sternum consists of two broad, parallel rods with tapered apices. Probably related to the rather larger, rounder-winged and more brightly pinkish cinnamon *E. irambata* Warren (1893).

SE. Tibet : Tsangpo Valley, Tya La, 14,000 ft., 20.ix.1924 (*F. Kingdon Ward*), holotype ♀.

Eupithecia leucoprora sp. n.

(Pl. 39 : B)

♂ 20 mm.; ♀ 24 mm. Both male and female antennae are very minutely ciliate. Male palpus slightly less than, female palpus slightly greater than the diameter of the eye. Male : palpus white beneath, cream buff above. Frons, head, thorax and abdomen cream buff very lightly irrorate with black. Fore wing olive ocher ; basal area evenly curved distad and uniformly black ; medial area densely irrorate with black, with little of the ground colour visible ; distal fourth of costa irrorate with black, deeply proximally, tapering apicad ; termen irrorate with black between veins R_1 and M_1, broadly at the tornus ; this black tornal area is divided by a slender fascia of the ground colour ; there is considerable black irroration between the basal and medial areas ; cell spot black ; fringes cream buff and black. Hind wing tilleul buff with a broad, drab, terminal border. The female differs in having a uniformly cream buff palpus. Eighth sternum of male weakly sclerotized and consisting of two broad, diagonally based arms, each tapered apicad, the inner margin of each arm is almost straight, the outer margin is larger and arcuate. Probably related to *E. biviridata* Warren (1896) from N. India but differing in having only the medial area fuscous on the fore wing.

Central Dutch New Guinea : Mt. Goliath, 5-7,000 ft., about 139° long., i-ii.1911 (*A. S. Meek*), holotype ♂ and allotype ♀.

Eupithecia lissopis sp. n.

(Pl. 39 : B)

♂ 27 mm.; ♀ 32 mm. Both male and female antennae minutely ciliate. Male palpus one and one-half times, female palpus twice as long as the diameter of the eye. Palpus, frons, head and abdomen olive buff irrorate with black, the abdomen also with dark vinaceous. Collar and thorax dark olive buff, the tegulae each with a white spot. Fore wing dark olive buff irrorate with black and dark vinaceous, especially in the basal, medial and terminal areas ; basal area edged distally with white ; medial area edged and irrorate in the discal area with white ; subterminal fascia white and punctiform ; cell spot black ; fringes chequered olive buff and fuscous and lightly suffused with dark vinaceous. Hind wing light buff and glossy, termen slenderly black. Eighth sternum in the male similar to that of the preceding species, but with the tapered apices produced posteriorly. Evidently related to *E. leucoprora*, but distinct in colour and pattern.

Central Dutch New Guinea : Mt. Goliath, 5-7,000 ft., about 139° long., i.1911 (*A. S. Meek*), holotype ♂ and allotype ♀.

Eupithecia eupitheciata (Walker) ab. ***cruentata*** (Warren MS.) ab. n.

Fore wing cartridge buff lightly and evenly irrorate with black; medial area slenderly margined with black, the posterior half densely irrorate with brick red.

INDIA: Khasia Hills, iii.1894 (*Nat. coll.*), holotype ♂; *ibid.*, without date, 1 ♀.

Micromia expectans sp. n.

(Pl. 39 : C)

♂♀ 25-28 mm. Antennae in both sexes minutely ciliate; palpi twice as long as the diameter of the eye. Palpus lime green irrorate with fuscous; frons, head, thorax and abdomen similarly coloured. Fore wing lime green suffused with yellowish olive and irrorate with brownish vinaceous, especially between the subcostal vein and the submedian fold; basal and sub-basal fasciae ill-defined, broad and fuscous; medial area irrorate with fuscous, proximal margin evenly curved, distal margin toothed between veins Sc_5 and R_1 and between R_3 and M_1 and in one example edged distally with a double, white fascia; subterminal fascia fuscous, broadly marked at costa, between veins R_1 and R_3 and between M_2 and the inner margin. Hind wing white to cartridge buff; transverse fasciae weakly and brokenly fuscous; terminal, interneural, tooth-like spots on both wings fuscous, more strongly marked on the fore wing. Closely related to *M. stabilis* Warren (1906), from which it differs in the darker irroration of the body and wings, the broader transverse markings and the stronger toothing of the distal margin of the medial area on the fore wing.

BRITISH NEW GUINEA: Angabunga R., affl. of St. Joseph R., 6,000 ft. upwards, xi.1904-ii.1905 (*A. S. Meek*), 1 ♂, 2 ♀, including holotype and allotype.

Micromia (Prosthetopteryx) hypocalypsis sp. n.

(Pl. 39 : C)

♂ 27 mm. Antenna minutely ciliate. Palpus twice as long as the diameter of the eye, light buff. Frons, head, thorax and abdomen light buff, the thorax and abdomen very lightly spotted with black. Fore wing broad and deep terminally, the inner margin fringed with long hair-scales medially; ground colour lime green very lightly irrorate with brownish vinaceous; basal fascia slender, slightly sinuous and black; sub-basal broad, ill-defined and black, extending only from the subcostal vein; medial area lightly irrorate with black and brownish vinaceous, ill-defined and marked only between the subcostal vein and the submedian fold; subterminal fascia broad, black and brownish vinaceous, marked only between vein Sc_4 and the discal fold with a patch of appressed, drab-gray scales between veins Sc_5 and M_1 and between M_2 and the submedian fold. Hind wing small, almost pyriform, cartridge buff and immaculate, with long hair-scales on the posterior half of the wing and along the anal margin. The shape of the wings and the specialized scaling on the hind wing make this a distinctive species in the genus.

PAPUA: Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), holotype ♂.

Micromia (Prosthetopteryx) euthynsis sp. n.

(Pl. 39 : D)

♂ 20 mm. Antenna minutely ciliate. Palpus twice as long as the diameter of the eye, light buff lightly irrorate with fuscous ; frons similarly coloured. Head, thorax and abdomen light buff densely irrorate with fuscous and russet. Fore wing lime green ; basal area fuscous, distal margin almost straight ; medial area fuscous, proximal margin toothed broadly distad in the discal fold, distal margin out-curved between veins R_1 and M_2, then straight to the inner margin ; sub-basal area irrorate with fuscous and with black at the inner margin ; postmedial fascia sinuous and clear lime green, from which two streaks extend through the fuscous, distal fourth of the wing to the termen, one slenderly between veins R_1 and R_2 and one broadly between R_3 and M_1 ; subterminal fascia white and punctiform, clearly marked only between the radial veins ; fringes chequered fuscous and lime green. Hind wing cartridge buff, the termen suffused with drab, bilobate, being cleft almost to the base of the wing along the submedian fold ; the posterior lobe is slender and extends for two-thirds of the length of the anterior part of the wing. As with most species in the genus, easily distinguished by wing-shape and structure and by pattern.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

Micromia (Prosthetopteryx) euthynsis evelina subsp. n.

Differs from the nominate subspecies in the better marked subterminal fascia and in the medial area of the fore wing, in which the anterior distal fourth is light buff and the remainder is more densely irrorate with fuscous to fuscous black.

PAPUA : Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), holotype ♂.

Micromia (Prosthetopteryx) leucocarpa sp. n.

(Pl. 39 : D)

♂ 25 mm. Antenna minutely ciliate. Palpus twice as long as the diameter of the eye, yellowish olive ; frons similar. Head and thorax yellowish olive irrorate with black ; abdomen light buff, anal segment yellowish olive. Fore wing lime green suffused with yellowish olive ; basal area black, posterior half irrorate with white and produced tornad to fuse with sub-basal fascia, which is russet, broad at the costa and tapered posteriorly ; medial area irrorate with russet and a little black, proximal margin slightly sinuous, distal margin toothed between veins Sc_5 and R_1 and on vein R_3 ; postmedial fascia lime green divided slenderly by yellowish olive, interrupted between veins Sc_5 and R_3 by a patch of white and between R_3 and M_1 by a patch of russet ; subterminal fascia punctiform, consisting of white spots ringed with black, the black sometimes streaking to the termen ; between the postmedial and subterminal fasciae there is a band of russet, interrupted between veins R_1 and R_3 by the diagonal, lime green, apical streak ; distad of the subterminal fascia the wing is lime green to yellowish olive. Hind wing cartridge buff and bilobate, the wing being cleft almost to the base along the submedian fold; the posterior lobe is broadened terminad and extends to seven-eighths of the length of the anterior part of the wing; medial veins bluish black; anal fringes long. A brightly coloured and distinctively patterned species.

PAPUA: Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), holotype ♂.

Micromia (Prosthetopteryx) acroscotia sp. n.

(Pl. 39: E)

♂ 24 mm.; ♀ 22 mm. Antenna in each sex minutely ciliate. Male palpus two and one-half times as long, female palpus twice as long as the diameter of the eye. Palpus, frons, head, thorax and abdomen light buff irrorate with fuscous. Fore wing lime green suffused with yellowish olive; basal part of wing, bounded by an arc from two-fifths costa to two-thirds inner margin, deep quaker drab irrorate proximally and distally with black; postmedial fascia boldly outcurved between veins R_1 and M_2, very slender, lime green; distad of the postmedial fascia is a broad band of deep quaker drab, interrupted by the ground colour between veins R_2 and M_1; termen slenderly and brokenly deep quaker drab. Hind wing light buff, the termen lightly irrorate with drab, bilobate and cleft almost to the base of the wing along the submedian fold; the posterior lobe is broadened terminad and extends for two-thirds of the length of the anterior part of the wing, which is tufted in its distal half. In the female the patagia and the abdomen are black and the hind wing is entire, tilleul buff and suffused with fuscous, especially terminad, with a faintly marked subterminal fascia of the ground colour. Distinguished from other species in the genus by the striking pattern.

PAPUA: Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), holotype ♂ and allotype ♀.

Micromia (Prosthetopteryx) novenaria sp. n.

(Pl. 39: D)

♂ 20 mm. Antenna minutely ciliate. Palpus twice as long as the diameter of the eye, lime green; frons, head and thorax similarly coloured, the tegulae irrorate with fuscous. Fore wing: proximal seven-eighths vinaceous slate suffused with dark perilla purple, the distal edge sharply and evenly dentate and bounded by the parallel, light buff subterminal fascia; basal fascia black; antemedial fascia lime green and sinuous, weakly marked; postmedial fascia lime green, boldly out-curved between veins R_1 and M_1 and sharply marked; distal eighth of wing lime green, except for the vinaceous slate apex; termen slenderly vinaceous slate; fringes chequered vinaceous slate and lime green. Hind wing tilleul buff lightly suffused with vinaceous slate, bilobate, cleft almost to the base of the wing along the submedian fold; the posterior lobe is equal in length to the anterior part of the wing; fringes light buff. Distinguished at once from other species in the genus by the remarkably distinctive pattern of the fore wing.

CENTRAL DUTCH NEW GUINEA: Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

Micromia (Prosthetopteryx) recessilinea sp. n.

(Pl. 39 : E)

♂ 19 mm. Antenna ciliate, the cilia equal in length to three times the diameter of the shaft. Palpus equal in length to twice the diameter of the eye, light buff; frons, head and thorax similar, the latter irrorate with dark vinaceous gray. Abdomen light buff, second and third segments crested with fuscous; extruded genital tufts cartridge buff; fore wing lime green irrorate for the greater part with dark vinaceous gray, especially densely in the basal, medial and terminal areas; postmedial fascia white and evenly curved from one-half costa to two-thirds inner margin, but clearly marked only posterior of vein M_1; distad of the postmedial fascia a short, broad band of the ground colour extends from vein M_1 to the inner margin; the only other areas of lime green are situate at the tornus, where there is a small spot and near the termen between veins Sc_5 and R_2. Hind wing tilleul buff suffused with drab terminad, bilobate, cleft along the submedian fold almost to the base of the wing; the posterior lobe is broadened distally and is equal in length to the anterior part of the wing; both parts are glossy and densely clothed with long hair-scales. Related to *M. rotundata* Warren (1906), from which it is distinguished by the colour and pattern of the fore wing and the drab, not violet, and more densely hairy hind wing.

BRITISH NEW GUINEA: Mambare R., 5,000 ft., iv.1906, (*A. S. Meek*), holotype ♂.

Micromia (Prosthetopteryx) dympna sp. n.

(Pl. 39 : E)

♂ 21 mm. Antenna ciliate, the cilia equal in length to the diameter of the shaft. Palpus twice as long as the diameter of the eye, light buff. Frons and head light buff. Thorax fuscous, the patagia and tegulae with a few light buff scales. Abdomen light buff, first, second and eighth segments irrorate with fuscous, second and third segments crested with fuscous. Fore wing deep olive buff densely irrorate with fuscous; basal, ante- and postmedial fasciae double, dentate, deep olive buff and ill-defined, except the postmedial, which is clearly marked posterior of the submedian fold; subterminal fascia slender and deep olive buff, clearly defined only at the tornus and between veins R_1 and R_3, where it is dilate to the termen and edged proximally with a white spot; basal area with a spot of orange cinnamon on the subcostal vein; medial area orange cinnamon in proximal half and distal fourth, the remaining slender band cinnamon edged proximally and distally with fuscous; fringes chequered light buff and fuscous. Hind wing tilleul buff, glossy and bilobate, cleft almost to the base along the submedian fold; posterior lobe one-half as long as the anterior part of the wing; fringes light buff. The conspicuous orange cinnamon of the fore wing quickly distinguishes this species from others in the genus.

CENTRAL DUTCH NEW GUINEA: Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

Micromia (Prosthetopteryx) conquadrata sp. n.

(Pl. 39 : F)

♂ 23 mm. Antenna minutely ciliate. Palpus twice as long as the diameter of the eye, warm buff; frons and head warm buff. Thorax warm buff densely irrorate with dark vinaceous drab. Abdomen cartridge buff, seventh and eighth segments irrorate with snuff brown, second and third segments crested with dark vinaceous drab. Fore wing dark vinaceous drab, basal and terminal areas irrorate with black; antemedial fascia black, angled on subcostal vein, thence straight to inner margin; postmedial fascia black, straight from costa to inner margin; medial area warm sepia with a little dark vinaceous drab suffusion; fringes chequered drab and fuscous. Hind wing bilobate, cleft almost to base along the submedian fold; posterior lobe broadened distally, cartridge buff and glossy, two-thirds as long as the anterior part, which is light quaker drab with drab fringes. A distinctive species both in colour and pattern.

The figure of this species on Pl. 39 : F evidently illustrates a female, having entire hind wings, but the specimen is not in the British Museum.

Central Dutch New Guinea: Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

Micromia (Prosthetopteryx) dystacta sp. n.

(Pl. 39 : F)

Similar in size, colour and pattern to *M. eusemozona* Prout (1916), with which it flies; the fore wing is deeper terminally, with a less acutely angled apex; the basal, medial and terminal areas are irrorate with ferruginous anterior of the subcostal vein, between the lower median and vein M_2 and posterior of the submedian fold and their margins are less smooth; the distal margin of the medial area is bulged terminad between veins R_3 and M_2, interrupting the lime green postmedial fascia, in some examples.

Papua: Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), 2 ♂, 2 ♀, including holotype and allotype.

Micromia (Prosthetopteryx) ectocosma sp. n.

(Pl. 39 : G)

♂ 20-21 mm. Antenna and palpus as in the preceding species. Frons, head, thorax and abdomen white to light buff, the thorax very lightly irrorate with black and light yellowish olive, the abdomen tipped with drab. Fore wing white suffused with light yellowish olive, the white visible only in the subcostal area, in the anterior half of the postmedial fascia and at the termen between veins R_3 and M_1; basal area irrorate with black; medial area, narrowed towards inner margin, irrorate with black, very lightly in discal area, densely posterior of the median vein, and with ferruginous; the distal margin of the medial area is toothed proximad with white along the subcostal vein; subterminal fascia slender, white and dentate, interrupted between veins Sc_5 and R_1 by a broad streak of white to pale salmon irrorate with ferruginous; between the postmedial and subterminal fasciae is a black band irrorate with ferruginous, broad at the costa, broken between veins Sc_5 and R_1, narrowed medially and broadened posteriorly to fuse with the medial area; terminal, interneural spots toothed proximad and black; fringes chequered black and white and lightly irrorate with ferruginous. Hind wing cartridge buff proximally, light quaker drab distally, incised half-way to *DC* between veins R_1 and R_3 and almost to base along the submedian fold; posterior lobe three-quarters as long as the anterior part, the posterior half of which is densely clothed with short hair-scales. Related to *M. infantilis* Warren (1907), from which it differs in the darkly irrorate sub-basal area, the broader medial area and the pattern and irroration of the terminal area of the fore wing.

CENTRAL DUTCH NEW GUINEA: Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), 3 ♂ including holotype.

Micromia (Prosthetopteryx) ni sp. n.

(Pl. 39 : G)

♂ 23 mm. Antenna minutely ciliate. Palpus rather less than twice as long as the diameter of the eye. Palpus, frons, head and anterior half of thorax cream buff; posterior half of thorax Vandyke brown; abdomen cream buff, second and third segments crested, first and eighth segments irrorate with dark vinaceous drab. Fore wing cleft half way to cell between veins M_1 and M_2 and produced a little and tapered between M_2 and submedian fold; ground colour dark vinaceous drab irrorate with black, except proximad of the postmedial fascia and on the projection posterior of vein M_2; basal fascia and the triangle formed with it within the basal area by the subcostal and median veins, oil yellow; the basal fascia is edged proximally with black; proximal two-thirds of subcostal vein and the double, antemedial fascia, which is marked only at the costa, oil yellow; postmedial fascia double, oil yellow distally, light buff proximally, extending from two-thirds costa to termen at vein R_3, thence acutely angled mediad and failing at the deepest point of the incision into the wing between M_1 and M_2; apical streak oil yellow; subterminal fascia very slender, cartridge buff, fusing with postmedial fascia at vein R_3 and further connected to it by a cartridge buff, zig-zag marking of the same colour between veins R_1 and R_3; inner margin marked with black and Vandyke brown; cell spot black and elongate; two small tufts of fuscous hair-scales are situate, one on the middle of vein R_2 and the second just posterior of it; fringes cream buff irrorate with drab; longer and denser in the posterior third of the wing. Hind wing tilleul buff irrorate with drab posteriorly, shallowly incised between veins R_1 and R_3 and cleft to one-half along submedian fold, the posterior lobe being equal in length to the anterior part of the wing. Related to *M. albimixta* Warren (1906), differing in the shape of the hind wing and in the colour and pattern of both wings.

CENTRAL DUTCH NEW GUINEA: Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

Micromia (Prosthetopteryx) thaumasia sp. n.

(Pl. 39 : H)

♂ 23 mm. Antenna minutley ciliate. Palpus equal in length to twice the diameter of the eye. Palpus, frons, head and thorax light yellowish olive to grape green. Abdomen cartridge buff, second and third segments crested, eighth segment irrorate with pinkish buff. Fore wing cleft to a little less than one-third between veins M_1 and M_2; basal area Vandyke brown irrorate with ferruginous; sub-basal area grape green; medial area white irrorate with Vandyke brown and ferruginous, densely costally and especially so just posterior of the median vein at the proximal side; posterior third of medial area cleanly white with the scales appressed anterior of the submedian fold; tornus and distal two-sevenths of costa broadly Vandyke brown irrorate with ferruginous; termen slenderly of the same colour in discal area; subterminal fascia cartridge buff, marked faintly at costa and broadly at inner margin only; remainder of terminal area grape green, toning to lime green distally; fringes lime green. Hind wing cartridge buff and glossy, trilobate with fringes of long hair-scales; the wing is cleft to the discocellulars between veins R_1 and R_3 and almost to base of wing along the submedian fold; the two anterior lobes are tapered distally, the costal one produced; the anal lobe is shorter, rounded and irrorate with deep mouse gray basad. Related to the preceding species, differing in the structure of the hind wing and in the colour and pattern of both wings.

Central Dutch New Guinea : Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), 2 ♂, including holotype.

Micromia (Prosthetopteryx) monochasma sp. n.

(Pl. 39 : H)

♂ 29 mm. Antenna minutely ciliate. Palpus two and one-half times as long as the diameter of the eye. Palpus, frons and head cartridge buff irrorate with lime green. Thorax lime green irrorate with fuscous. Abdomen cartridge buff irrorate with lime green and drab. Fore wing much broadened distally, apex produced; ground colour lime green, a little sparsely scaled; transverse fasciae ill-defined and broken, fuscous, lightly irrorate with brownish vinaceous in the discal and submedian folds; termen slenderly fuscous, toothed proximad between the veins; fringes chequered lime green and fuscous. Hind wing cartridge buff and glossy, broadly incised along three-fifths of the length of the submedian fold; vein M_2 in the anterior part of the wing is produced beyond the termen as a small, tufted fold; posterior lobe broadened distally, termen crenulate. Distinguished from other species in the genus by the broad incision in the hind wing and by the colour and pattern of the fore wing.

Central Dutch New Guinea : Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

Micromia (Prosthetopteryx) dilopha sp. n.

(Pl. 39 : H)

♂ 26 mm. Antenna minutely ciliate. Palpus twice as long as the diameter of the eye, pinkish cinnamon. Frons and head pinkish cinnamon densely irrorate with bister, the head with a few white scales. Prothorax and mesothorax bister; metathorax white; patagia pinkish cinnamon; tegulae broadly pinkish cinnamon in basal third, white in medial third and bister in apical third. Abdomen white anteriorly shading to light buff posteriorly, lightly irrorate with bister; first and seventh segments each bear a pair of long, pinkish cinnamon hair tufts laterally. Fore wing pinkish cinnamon, thinly scaled in distal half between veins Sc_5 and M_1, and irrorate with black, lightly in the proximal and distal thirds of the subcostal area and densely posterior of the median vein and vein M_1; postmedial fascia white and double, broadly marked at costa, then only faintly on the veins, where it is edged proximally with a few black scales; subterminal fascia punctiform, black proximally and white distally, the black part being much enlarged proximad between the radial and medial veins; cell spot large, tufted and black; inner margin tufted with black scales at one-third and in distal third; termen slenderly fuscous; fringes pinkish cinnamon, white-spotted at the vein ends. Hind wing widely cleft almost to base along submedian fold; posterior lobe cartridge buff, equal in length to the anterior part, which is cartridge buff except for the posterior, distal fourth, which is light quaker drab; vein M_2 is produced as a small, densely tufted fold. Similar in wing structure to the preceding species, but quite distinct in colour and pattern.

CENTRAL DUTCH NEW GUINEA: Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

Chloroclystis consueta bowringi subsp. n.

(Pl. 39 : H)

Differs from *c. consueta* Butler (1897) from Japan in colour. In the nominate subspecies the pattern is marked in drab; in *bowringi* it is marked in fuscous black; on the fore wing the basal fascia is strongly marked; the medial area is broadly margined proximally and slenderly margined distally and irrorate with fuscous black anterior of the median vein.

CHINA: SE. Ichang, Ya-chiao-ling, vi.1922 (*C. T. Bowring*), 3 ♂, 3 ♀, including holotype and allotype.

Chloroclystis leucopygata cata subsp. n.

Darker, more fuscous in colour with scarcely a trace of the red-brown tone, which is present in *l. leucopygata* Warren (1896) and especially in *l. icteraria* Swinhoe (1903); the white, subterminal dots on both wings are more sharply marked, the one between veins R_3 and M_1 on the hind wing enlarged. Underside with the fuscous black postmedial band intensified.

SW. CELEBES: Pangean near Maros, 2,000 ft., iii.1938 (*J. P. A. Kalis*), 6 ♂, 4 ♀, including holotype and allotype.

Chloroclystis horistes sp. n.

(Pl. 39 : I)

♂ 26 mm. Antenna minutely ciliate. Palpus twice as long as the diameter of the eye, heavily scaled. Palpus, frons, head and thorax cartridge buff, patagia and tegulae pale olivine. Abdomen long and slender, warm buff (?discoloured green), the second, third and eighth tergites fuscous. Fore wing pale olivine; basal, ante- and postmedial fasciae slender and broken, fuscous; sub-basal and medial areas irrorate with fuscous and with a little vinaceous brown in the subcostal region; subterminal fascia weakly marked, white edged proximally with broad, fuscous patches at the costa, between the radial veins and posterior of vein M_2; cell spot elongate and fuscous. Hind wing pale olivine, proximal half irrorate with fuscous; subterminal fascia white and dentate, broadly edged proximally with fuscous. Termen in each wing slenderly fuscous. Differs from *C. hypopyrrha* West (1929) in the very much paler green ground colour of the wings and the very clearly defined, white subterminal fascia on the hind wing.

NEPAL (Frontier of): Phalloloong, 12,600 ft., vii.1905, holotype ♂.

Chloroclystis atroviridis perspecta subsp. n.

♀ 27 mm. Larger than *a. atroviridis* Warren (1893) from Assam, which has a wing span of 20-22 mm., darker green, bice green instead of pale olivine, and both wings are irrorate with fuscous, the fore wing in the discal and submedian areas and the hind wing in the basal half; the termen is slenderly fuscous and the fringes are heavily spotted with fuscous at the vein ends on both wings.

CEYLON : Patipola, xi.1908, holotype ♀.

Chloroclystis boarmica sp. n.

(Pl. 39 : I)

♀ 22 mm. Palpus one and one-half times as long as the diameter of the eye. Palpus, frons, head, thorax and abdomen light buff very lightly irrorate with fuscous; tergites two to seven densely irrorate with black. Fore wing with areole broad and vein Sc_1 anastomosing almost immediately with the costal vein; ground colour light buff lightly irrorate with fuscous anterior of the postmedial fascia, densely irrorate with fuscous and faintly tinged with green posterior of it; transverse fasciae, except subterminal, fuscous and ill-defined; basal fascia broad and evenly curved from costa to inner margin; antemedial fascia inclined tornad from costa, acutely angled in discal fold, thence straight to inner margin; medial and postmedial fasciae parallel to antemedial and slender; subterminal fascia light buff and dentate, sharply defined and edged proximally with dense fuscous; termen slenderly fuscous black, streaked proximad between the veins to reach the subterminal fascia; cell spot minute; fringes fuscous with light buff spots at the vein ends. The hind wing differs only in the basal half, where the transverse fasciae are all slender, parallel to the termen and fail anterior of the subcostal vein. Superficially resembles a S. American *Physocleora*; placed provisionally next to *C. infrazebrina* Hampson (1895), from which it differs both in size and pattern, but may well have a specialized male.

SW. CELEBES: G. Lampobattang, Parango-bobo-Goa, 5,000 ft., v.1938 (*J. P. A. Kalis*), 4 ♀, including holotype; G. Tompoe, Paloe, 2,700 ft., i.1937 (*J. P. A. Kalis*), 1 ♀; G. Rangkoenau, Paloe, 1,800 ft., xii.1936 (*J. P. A. Kalis*), 1 ♀.

Chloroclystis naga sp. n.

(Pl. 39 : I)

♀ 20 mm. Palpus rather longer than the diameter of the eye, drab irrorate with fuscous. Frons slightly produced, of similar colour. Head light drab. Thorax light drab irrorate with smoke gray. Abdomen brownish drab, the second, third, seventh and eighth segments fuscous. Fore wing drab with a tinge of cinnamon in the sub-basal area and distad of the medial area and lightly irrorate with smoke gray; basal fascia fuscous; postmedial fascia fuscous, broad in anterior third and toothed strongly proximad in the discal fold; subterminal fascia pale and very faintly marked, edged proximally by a large, fuscous spot both at the costa and the submedian fold. Hind wing with termen shallowly incurved between veins R_1 and R_3; general colour as on fore wing; basal fascia broad, postmedial finely toothed proximad in discal fold, right-angled between veins R_3 and M_1, thence dentate to anal margin; subterminal fascia scarcely traceable and with a little fuscous irroration proximad of it at anal margin. Fringes of both wings drab with pale points at the vein ends. Similar in general appearance to *C. speciosa* Swinhoe (1902), but differing in the almost uniformly gray-brown distal thirds of both fore and hind wings.

INDIA: Naga Hills, 5-7,000 ft., viii-ix.1889 (*W. Doherty*), holotype ♀.

Chloroclystis sinuosa reddita subsp. n.

(Pl. 39 : K)

♂♀ 14 mm. Smaller than either *s. sinuosa* Swinhoe (1895) or *sinuosa nigrilineata* Hampson (1896) and brown instead of gray in general appearance. Both wings are irrorate with bister and the fuscous transverse fasciae are less well-defined and contrasted than in either of the other two subspecies.

CEYLON: Haputale, July, holotype ♂; *ibid.*, September, 1 ♂; Maskeliya, August, allotype ♀; Madulsima, xi.1905, 1 ♂; Hanbantola (*J. Pole*), 2 ♂, 1 ♀.

Chloroclystis griseorufa tranquillata subsp. n.

Differs from *g. griseorufa* Hampson (1898) in the fore wing, in the less dentate antemedial fascia and particularly in the shape of the postmedial fascia, which is sinuous; in the nominate subspecies the postmedial fascia of the fore wing is produced distad and acutely angled on vein R_3.

MALAYA: Kuala Lumpur, 11.v.1931 (*H. M. Pendlebury*), holotype ♀.

Chloroclystis actephilae sp. n.

(Pl. 39 : K)

♂ 18-20 mm.; ♀ 22-23 mm. Both male and female antennae minutely ciliate. The palpi are equal in length to the diameter of the eye. Palpus, frons and head cartridge buff, the palpus irrorate with fuscous. Thorax honey yellow, patagia and tegulae light drab. Abdomen cartridge buff irrorate with light drab, each segment with a pair of honey yellow spots ; in the male the first three segments are fuscous. Fore wing : costa light drab to mouse gray ; two pale fasciae cross the medial area, other transverse fasciae cartridge buff edged both proximally and distally with drab to mouse gray ; basal fascia usually wanting ; antemedial bowed mediad between subcostal vein and submedian fold ; basal and medial areas and that area between the postmedial and subterminal fasciae honey yellow ; cell spot wanting ; fringes chequered cartridge buff and drab. Hind wing : postmedial fascia right-angled between veins R_3 and M_1, proximad of which it is honey yellow irrorate with drab to mouse gray costally and crossed by a pale medial fascia : remainder of wing similar to fore wing. Related to *C. polygrapha* Hampson (1912), from which it differs in the softer tone of the pattern and the conspicuous honey yellow medial area.

S. India : Kanara, Castle Rock, 3-11.vi.1920 (*T. R. Bell*), 11 ♂, 25 ♀, including holotype and allotype ; Western Ghats (*T. R. Bell*), 2 ♂, 2 ♀.

Chloroclystis eichhorni sp. n.

(Pl. 39 : L)

♂ 12 mm. Antenna simple. Palpus one and one-half times as long as the diameter of the eye. Palpus, frons, head and thorax pale smoke gray irrorate with black. Abdomen lime green. Fore wing lime green ; proximal two-thirds of costa slenderly black ; distal sixth of costa and termen, except between veins R_3 and M_1, smoke gray ; discal area lightly irrorate with smoke gray ; veins with a few black scales ; black antemedial fascia marked in discal fold only ; black postmedial fascia extends diagonally terminad from two-thirds costa almost to termen, failing between veins R_3 and M_1 ; fringes smoke gray with pale points at the vein ends. Hind wing : anal margin lime green with a black spot indicating the only part of the postmedial fascia which is marked ; remainder of wing drab. Related to *C. fragilis* Warren (1899), from which it differs in the bright lime green fore wing and the almost uniformly drab hind wing.

New Ireland : xi-xii.1923 (*A. F. Eichhorn*), holotype ♂.

Chloroclystis distigma sp. n.

(Pl. 40 : A)

♀ 18-19 mm. Similar in size and general appearance to *C. exsanguis* Warren (1907) ; ground colour of wings lime green ; basal two-fifths of costa black with the beginning of the antemedial fascia produced to just posterior of the subcostal vein ; postmedial fascia marked by a broad, black spot at three-fifths costa and by a black spot at two-thirds inner margin ; subterminal fascia white and dentate, edged proximally with black between the veins, more broadly at costa and tornus.

DUTCH NEW GUINEA : Snow Mts., Upper Setekwa River, 2-3,000 ft., viii.1910 (*A. S. Meek*), 2 ♀, including holotype.

Chloroclystis rhodopis sp. n.

(Pl. 40 : A)

♂ 15 mm.; ♀ 18 mm. Similar in size and general appearance to *C. continuata* Warren (1907). On the fore wing the ferruginous irroration is much reduced and differently distributed, being confined to the basal area, the apex and between veins R_1 and M_2 distad of the postmedial fascia, which is acutely angled between veins R_2 and R_3 and thence extends almost straight to one-half inner margin ; the medial area is white ; the transverse fasciae are irrorate with ferruginous and are not uniformly fuscous as in that species. On the hind wing the basal area is white, not broadly fuscous and the postmedial fascia is smooth and not dentate.

BRITISH NEW GUINEA : Hydrographer Mts., 2,500 ft., iv.1918 (*Eichhorn Bros.*), holotype ♂.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), 1 ♀.

Chloroclystis infusata errabunda subsp. n.

Differs from *i. infusata* Walker (1866) in the more sharply defined postmedial fascia on both wings ; also in the white to cartridge buff irroration, especially in the subcostal region of the fore wing both proximad and distad of the medial area.

FORMOSA : 11.vi.1907 (*A. E. Wileman*), 1 ♂ ; Takow, 28.ix.1904 (*A. E. Wileman*), holotype ♂ ; *ibid.*, 30.viii.1904, 1 ♂, 1 ♀ ; Kanshirei, 28.iv-8.v.1908 (*A. E. Wileman*), 2 ♂, 1 ♀.

Chloroclystis infusata albitornalis subsp. n.

(Pl. 40 : B)

Ground colour bister ; on the fore wing the basal area and the distal third, between veins R_3 and M_1, are densely irrorate with light buff. On the hind wing the posterior half of the distal third is similarly irrorate.

S. INDIA : Karwar, 18-23.viii.1926 (*T. R. Bell*), 2 ♂, 5 ♀, including holotype and allotype ; Belgaum (*Watson coll.*), 1 ♀ ; Travancore, Peermade (*Mrs. Imray*), 1 ♀.

CEYLON : 4 ♂, 2 ♀ ; Puttalam, 1 ♂ ; Putaloya, 1 ♂ ; Maskeliya, 1 ♀ ; Uva, 1 ♀ ; Patipola, 1 ♂ ; Kalutara, 1 ♂.

Chloroclystis infusata exortiva subsp. n.

A little smaller than the preceding subspecies and more contrastingly marked.

The ground colour is even darker than in *i. albitornalis* and the irroration paler, cartridge buff and more diffuse in the proximal half of the fore wing.

ROSSEL I.: Mt. Rossel, 2,100 ft., xi-xii.1915 (*W. F. Eichhorn*), 7 ♂, 10 ♀, including holotype and allotype.

GOODENOUGH I.: 2,500-4,000 ft., iii.1913 (*A. S. Meek*), 1 ♀.

NEW HANOVER : iii.1913 (*A. S. Meek*), 1 ♀.

ROOK I.: vii.1913 (*A. S. Meek*), 1 ♂.

Chloroclystis taraxichroma sp. n.

(Pl. 40 : A)

♂♀ 15-16 mm. Palpus one and one-half times as long as the diameter of the eye. Palpus, frons, thorax and abdomen cartridge buff densely irrorate with light drab to hair brown. Head light to warm buff. Fore wing light drab to hair brown; double postmedial and single medial and subterminal fasciae dentate and parallel to termen, light buff in subcostal region, then smoke gray; antemedial fascia and posterior part of medial area light to warm buff; veins sparsely scaled with black; cell spot wanting; fringes light drab proximally and spotted light buff at the vein ends, smoke gray distally. Hind wing similar to fore wing, except that the transverse fasciae are light buff at the anal margin and not at the costa; in one specimen the greater part of the wing is light buff. Related to *C. latifascia* Walker (1866), differing in the light buff posterior part of the medial area on the fore wing.

E. BALI : Batoeriti, 3,500 ft., vi.1935 (*J. P. A. Kalis*), holotype ♂ and 1 ♀; Git-Git, v.1936 (*J. P. A. Kalis*), allotype ♀.

Chloroclystis breyniae sp. n.

(Pl. 40 : A)

♂♀ 12-13 mm. Palpus a little longer than the diameter of the eye. Palpus, frons, head, thorax and abdomen light drab to drab gray irrorate with vinaceous brown to fuscous; wings similarly coloured. On the fore wing the postmedial fascia is pale, divided and edged both proximally and distally with fuscous, angled on vein R_1, thence direct to five-eighths inner margin; subterminal fascia pale, dentate and parallel to termen; radial and medial veins irrorate with fuscous. Hind wing similar, except for the postmedial fascia, which is parallel to the termen; the termen is almost regular, only faintly sinuous; vein Sc_2 is short-stalked. Underside paler, especially the hind wing, and weakly marked; fore wing with ill-defined, pale bands representing postmedial and subterminal fasciae; hind wing with postmedial fascia present and with appreciable shading on each side of the subterminal fascia. An inconspicuous and weakly marked species provisionally placed next to *C. latifascia* Walker (1866).

INDIA : Pusa, reared from larva found on *Breynia rhamnoides*, 5.v.1920 (*Rangi coll.*), holotype ♂; *ibid.*, larva collected 10.xi.1922, pupated, 13.xi.1922, emerged 25.xi.1922, allotype ♀; Pusa, 19.vii.1923 (*Box coll.*), 1 ♂.

Chloroclystis woodjonesi sp. n.

(Pl. 40 : B)

♀ 15-17 mm. Palpus twice as long as the diameter of the eye, cartridge buff, the first segment sometimes warm sepia. Frons, head, thorax and abdomen cartridge buff, thorax and abdomen irrorate with warm sepia. Fore wing : proximal three-fourths cartridge buff to light buff irrorate with warm sepia distally ; terminal fourth warm sepia ; the whole is irrorate with iridescent smoke gray, more densely in the distal half of the wing ; basal and antemedial fasciae dentate and fuscous ; antemedial fascia toothed sharply distad in submedian fold ; postmedial fascia warm sepia, sinuous anterior of vein R_3 and parallel to termen posterior of it ; two dentate fasciae of the ground colour extend parallel to the termen in the distal fourth of the wing ; fringes warm sepia proximally with slenderly connected warm buff spots at the vein ends and drab distally. Hind wing similar. Related to *C. lepta* Meyrick (1886), from which it differs in the smoother postmedial fascia and the darker, terminal fourths of both wings.

COCOS KEELING I.: (*F. Wood-Jones*), 2 ♀, including holotype ; *ibid.*, vi.1903, 1 ♀ ; *ibid.*, vi.1905, 1 ♀.

Chloroclystis lepta aeneta subsp. n.

Pasiphela lepta Meyrick, 1886, *Trans. ent Soc. Lond.* **1886** : 191 (part).

Differs from *l. lepta* from the Marshall Islands in the ground colour of the wings, which is white instead of tilleul buff ; the markings are pale, except at costa, and more sharply defined and contrasted.

TONGA : holotype ♀.

Chloroclystis invisibilis invita subsp. n.

(Pl. 40 : B)

Differs from *i. invisibilis* Warren (1893) in wing pattern. On the fore wing the antemedial fascia is less dentate, the strongly projecting, proximal tooth in the submedian fold is much reduced ; the postmedial fascia is slender and weakly marked. On the hind wing the postmedial fascia is bowed basad in the discal area and not evenly curved as in the nominate subspecies.

W. CELEBES : Koelawi, Paloe, 3,700 ft., iii-iv.1937 (*J. P. A. Kalis*), holotype ♂ and allotype ♀.

Chloroclystis filata (Guenée) ab. ***albiplaga*** ab. n.

Posterior of the median vein and vein R_3, the distal seven-eighths of the medial area is white.

NEW SOUTH WALES : Sydney, x.1878 (*G. H. R.*), holotype ♀.

Chloroclystis magnimaculata irabunda subsp. n.

(Pl. 40 : D)

Differs from *m. magnimaculata* Philpott (1915) in the suffusion of both wings with russet ; the white, dentate postmedial fascia is, on that account, more clearly defined.

NEW ZEALAND : Flagstaff, 8.xii.1914, 5 ♂ ; *ibid.*, 2.i.1915, 9 ♂, including holotype.

Chloroclystis lanaris aequabilis subsp. n.

Differs from *l. lanaris* Warren (1896) in the suffusion of the paler areas of both wings with lime green ; on the fore wing the bister irroration proximad of the clearly marked and strongly contrasted, white antemedial, postmedial and subterminal fasciae is intensified and dense.

SUDEST I.: Mt. Riu, 2,000 ft., iii.1916 (*Eichhorn Bros.*), holotype ♂.

Chloroclystis antarctica Hudson ab. ***hudsoni*** ab. n.

(Pl. 40 : E)

This aberration was described and figured by Hudson (1928, *Butterflies and Moths of New Zealand*, 93, pl. 44 : 4), but was not named. According to Hudson, it is " a rather remarkable brown form with similar markings to the ordinary *C. bilineolata* " and is recorded from Arthur's Pass in the South Island of New Zealand.

Chloroclystis xenisma sp. n.

(Pl. 40 : I)

♂ 17 mm.; ♀ 18 mm. Antennae ciliate ; male cilia one-half as long as the diameter of the shaft ; female cilia minute. Male palpus one and one-half times as long, female palpus twice as long as the diameter of the eye, light buff. Frons and head light buff. Thorax and abdomen drab gray. Male : fore wing with arched costa, drab gray to light quaker drab ; postmedial fascia double and lunulate ; subterminal fascia single and dentate, both tilleul buff edged proximally with some fuscous suffusion ; basal third of costa and veins fuscous, the latter with a few, scattered, black scales ; termen slenderly fuscous ; fringes chequered drab gray and light buff. Hind wing with slightly crenulate termen and, except for costa, similarly coloured to the fore wing. Underside smoke gray and glossy ; basal two-fifths of fore wing densely clothed with specialized, ochraceous orange scales, which lengthen in the medial fifth of the wing and are black ; basal half of hind wing similar to base of fore wing. In the female the costa of the fore wing is not arched and the underside of both wings is drab, rather darker distally. Distinctive in the genus on account of the vivid male underside and the colour of the uppersides of both sexes.

W. CELEBES : G. Tompoe, Paloe, 2,700 ft., ii.1937 (*J. P. A. Kalis*), holotype ♂ ; *ibid.*, i.1937, allotype ♀ ; Koelawi, Paloe, 3,100 ft., iii.1937 (*J. P. A. Kalis*), 1 ♂.

Chloroclystis pugnax sp. n.

(Pl. 40 : I)

♂ 17 mm. Antenna similar to that of the preceding species. Palpus one and one-quarter times as long as the diameter of the eye, drab. Frons, head and thorax drab. Abdomen pinkish buff irrorate with drab, segments 4-7 edged posteriorly with fuscous. Fore wing tilleul buff lightly irrorate with drab, except immediately proximad and distad of the medial area, which is densely drab, the margins slenderly bister; proximal margin bowed gently distad in submedian fold, distal margin bowed boldly terminad between veins R_2 and M_2. Hind wing similar, but with a paler and with a much less well-defined medial area; basal area densely bister. Underside tilleul buff and glossy suffused costally with pinkish buff; anterior of the submedian fold, from one-seventh to one-half costa, the fore wing is densely clothed with short, fuscous black scales. Related to the preceding species, from which it differs in the shorter palpus and in the pattern of both the upper and undersides of both wings.

British New Guinea: Hydrographer Mts., 2,500 ft., i.1918 (*Eichhorn Bros.*), holotype ♂.

Chloroclystis apotoma sp. n.

(Pl. 40 : I)

♂ 16 mm. Antenna ciliate, the cilia one-half as long as the diameter of the shaft. Palpus one and one-half times as long as the diameter of the eye. Palpus, frons, head and thorax cartridge buff, palpus and lower frons irrorate with fuscous; tegulae tinged very faintly with lime green. Abdomen: first segment cartridge buff irrorate with pinkish cinnamon and with a fuscous, medio-dorsal spot; second segment ferruginous with some fuscous irroration; remainder pinkish cinnamon. Fore wing: costa arched, the medial fifth tufted; ground colour cartridge buff lightly tinged with lime green; anterior half of basal area irrorate with fuscous; fuscous antemedial fascia acutely angled basad on median vein; medial third of wing, from costa to vein M_2, densely clothed with specialized, ferruginous scales; posterior of M_2 it is irrorate with fuscous; distal third of wing irrorate with cinnamon buff and fuscous; subterminal fascia faintly defined, broadly edged on proximal side with fuscous, except between radial veins, and toothed distad, slenderly in fuscous, posterior of vein R_3; termen broadly tinged with quaker drab, except at tornus, which is densely cinnamon. Hind wing cartridge buff lightly tinged with lime green and crossed by several slender, ill-defined, fuscous fasciae. Underside: fore wing pinkish cinnamon suffused with bister in proximal third of costa. Hind wing tilleul buff, margins tinged with pinkish cinnamon; cell spot and postmedial fascia faintly drab. Related to *C. tortuosa* West (1929) from the Philippine Is., differing in its smaller size, deeper coloured and less extensive specialized scaling on the fore wing and in the more densely marked hind wing.

S.W. Celebes: G. Lampobattang, Parang-bobo-Goa, 5,000 ft., v.1938 (*J. P. A. Kalis*), holotype ♂.

Chloroclystis omocydia sp. n.

(Pl. 40 : I)

♂ 14 mm. Antenna minutely ciliate. Palpus one and one-half times the diameter of the eye. Palpus, frons, head and thorax cartridge buff irrorate with deep olive buff, palpus and lower frons also irrorate with fuscous; tegulae each with a large spot of old rose. Fore wing cartridge buff irrorate with deep olive buff; costa arched; basal two-fifths of subcostal region old rose irrorate with fuscous distally; an area of dense, long, cartridge buff, specialized scaling extends posteriorly from medial fifth of costa to discal fold; posterior of discal fold there is a larger area of shorter, drab, specialized scaling extending from two-fifths to four-fifths submedian vein; subterminal fascia white and dentate, edged broadly on the proximal side with drab, except between vein R_1 and discal fold; distad of the subterminal fascia the wing is deep olive buff, the subcostal and radial veins lightly irrorate with black; subcostal, median and submedian veins similarly marked in basal third of wing; fringes chequered light buff and drab. Hind wing, including fringes, deep olive buff; transverse fasciae pale and largely ill-defined; postmedial double, subterminal single and dentate; veins lightly irrorate with black. A distinctive species recognizable by the specialized scaling and the bright, old rose proximal two-fifths of the subcostal region of the fore wing.

British New Guinea: Hydrographer Mts., 2,500 ft., iv.1918 (*Eichhorn Bros.*), holotype ♂.

Chloroclystis autopepla sp. n.

(Pl. 40 : I)

♂ 17 mm. Antenna minutely ciliate. Palpus proportioned as in the preceding species. Palpus, frons, head and thorax cartridge buff, palpus and lower frons densely irrorate with black and pinkish vinaceous. Abdomen: first and second segments black and pinkish vinaceous; remainder deep to dark olive buff, seventh segment spotted with black laterally. Fore wing: costa arched; proximal two-fifths of subcostal region pinkish vinaceous irrorate with black, posterior of which is an area of deep to dark olive buff extending diagonally distad to three-fifths inner margin with black spots, two on vein M_2, one at base and one at one-third, and two on submedian vein, one at one-fifth and one at three-fifths; a band of warm buff, specialized scaling extends diagonally tornad from medial fifth of costa, failing just posterior of discal area; remainder of wing, except apex, pinkish vinaceous irrorate with fuscous, especially strongly proximad of the dentate, cartridge buff subterminal fascia; apex cartridge buff irrorate with pinkish vinaceous; fringes chequered cartridge buff and drab. Hind wing, including fringes, deep to dark olive buff; medial fascia sinuous and broad, black distally, pinkish vinaceous proximally, distad of which the veins are very lightly irrorate with black.

Central Dutch New Guinea: Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

Chloroclystis alpinista eupora subsp. n.

(Pl. 40 : K)

Differs from *a. alpinista* Turner (1907) in the colour of the wings, which is light vinaceous cinnamon instead of fuscous brown.

KEY IS.: 2.iii.1897 (*H. Kühn*), 1 ♂.

W. BALI : Mondoktoempang, 2,500 ft., x.1934 (*J. P. A. Kalis*), holotype ♀.

S.W. CELEBES : Tjamba, near Maros, 1,500 ft., ii.1938 (*J. P. A. Kalis*), 1 ♀; Koelawi, Paloe, 3,100 ft., iii.1937 (*J. P. A. Kalis*), 1 ♀.

PHILIPPINE IS.: Luzon, Benguet, Klondyke, 800 ft., 19.xii.1911 (*A. E. Wileman*) 1 ♀.

Chloroclystis acervicosta sp. n.

(Pl. 40 : K)

♂ 12 mm. Antenna ciliate, the cilia one-third as long as the diameter of the shaft. Palpus one and one-half times as long as the diameter of the eye. Palpus, frons, head, thorax and abdomen tilleul buff irrorate with vinaceous brown and fuscous; abdomen the most densely irrorate. Fore wing tilleul buff irrorate with vinaceous brown and fuscous, densely in the medial area; densely also between the pale postmedial and subterminal fasciae, except between veins Sc_5 and R_2 and between R_3 and M_2; medial third of wing, anterior of discal fold, densely clothed with long hair scales, which are tilleul buff tipped with fuscous. Hind wing similarly coloured; posterior half of distal third, except anal angle, clear tilleul buff. Distinguished by its small size and by the specialized scaling on the fore wing.

SAMBAWA : iv.1891 (*Doherty*), holotype ♂.

Chloroclystis catabares sp. n.

(Pl. 40 : K)

♂ 14 mm.; ♀ 15 mm. Antennae shortly ciliate in both sexes, the cilia equal in length to one-third of the diameter of the shaft, rather denser in the male. Male palpus one and one-third, female palpus one and one-half times as long as the diameter of the eye. Palpus, frons, head, thorax and abdomen cartridge buff irrorate with purplish vinaceous and fuscous, frons and head lightly, palpus, thorax and abdomen densely; patagia and tegulae tipped with smoke gray. Male. Fore wing: costa arched medially; ground colour cartridge buff very faintly tinged with green, clearest in subbasal area; basal, medial and terminal areas irrorate densely with purplish vinaceous and edged lightly with fuscous; medial area tufted with short, specialized scaling along costa; double postmedial and single subterminal fasciae pale; distad of the subterminal fascia the wing is light quaker drab; termen slenderly fuscous; fringes chequered cartridge buff and drab. Hind wing with termen evenly rounded; similar in colour to fore wing, but lacks specialized scaling along costa. The female differs in having a less arched costa and lacking the specialized scaling on the fore wing. Placed provisionally next to *C. modesta*

Warren (1893), from which it differs in the less pronounced arching of the costa of the male fore wing, the evenly rounded termen of the hind wing in both sexes and in wing pattern.

W. Celebes : Paloe, G. Tompoe, 2,700 ft., ii.1937 (*J. P. A. Kalis*), 5 ♂, 7 ♀ including holotype and allotype ; Paloe, G. Rangkoenau, 900 ft., ix.1936 (*J. P. A. Kalis*), 1 ♀ ; *ibid.*, 1,800 ft., xii.1936, 1 ♀ ; Pangean, near Maros, 2,000 ft., iii.1938 (*J. P. A. Kalis*), 1 ♂.

Chloroclystis curviscapulis sp. n.

(Pl. 40 : K)

♂ 19 mm. Antenna minutely ciliate. Palpus one and one-quarter times as long as the diameter of the eye. Palpus, frons, head, thorax and abdomen cream buff (possibly faded dark olive buff) irrorate with fuscous and black, palpus and lower frons the most densely irrorate. Fore wing : costa strongly arched in basal third ; ground colour dark olive buff irrorate with fuscous, densely in the sub-basal area, in the distal fourth of the medial area and in the distal third of the wing anterior of the discal fold ; veins sparsely scaled with black ; postmedial fascia tilleul buff shaded both proximally and distally with black ; subterminal fascia tilleul buff, slender and strongly dentate, marked only in anterior half of wing ; termen slenderly fuscous ; fringes fuscous proximally, paling to drab in distal half with cream buff spots at the vein ends. Hind wing : ground colour dark olive buff irrorate with fuscous ; medial area crossed from costa to anal margin by three ill-defined fuscous fasciae ; subterminal fascia traceable only by its broad, fuscous, proximal shade and by a large, white spot between veins R_3 and M_1 ; termen and fringes as on fore wing. Related to *C. subcostalis* Hampson (1893), from which it differs in the fore wing, having a less sharply arched costa, a less clearly defined postmedial fascia and lacking the subcostal fold of that species with its specialized scaling. The female specimen represented on Pl. 40 : K is not in the British Museum and its present whereabouts are not known.

India : Darjeeling, Gopaldhara, 3,440-5,800 ft. (*H. Stevens*), holotype ♂.

Chloroclystis melampepla sp. n.

(Pl. 40 : L)

♀ 19 mm. Antenna minutely ciliate. Palpus one and one-third times as long as the diameter of the eye, black tipped with olive buff. Frons and head olive buff irrorate with black. Thorax smoke gray densely irrorate with black. Abdomen : first segment black, remainder dark olive buff, the segments slenderly edged posteriorly with fuscous. Fore wing : basal third dark olive buff irrorate proximally and distally with black ; ante- and postmedial fasciae parallel, curved boldly terminad medially, slender, lunulate and fuscous ; distad of the postmedial fascia, areas of dark olive buff are situate at costa and inner margin ; subterminal fascia pale and faintly marked, edged proximally by two conspicuous, fuscous areas, one at costa and one in discal fold ; remainder of wing olive buff very sparsely irrorate with black. Hind wing : anal margin and distal third dark olive buff ; remainder olive buff, the whole irrorate with fuscous ; veins very sparsely irrorate with black ; basal fascia broadly black ; medial area slenderly edged distally, subterminal fascia broadly shaded proximally with black ; a large, white spot is situate in terminal ninth between veins R_3 and M_1. Almost certainly related to *C. subcostalis* Hampson (1893), from which it differs in the gray-green rather than pinkish cinnamon general colour, in the less well-defined lunulate and more slender postmedial fascia and in the more strongly contrasted, fuscous antemedial and terminal markings. Until the male is known, one cannot be sure that this species is correctly placed, as it has some similarity to *C. invisibilis invita* Prout.

W. CELEBES : Paloe, G. Rangkoenau, 1,800ft., xii. 1936 (*J. P. A. Kalis*), holotype ♀.

Chloroclystis orphnobathra sp. n.

(Pl. 40 : K)

♂ 16 mm. Antenna minutely ciliate. Palpus equal in length to the diameter of the eye ; first segment broad, second segment slender, both long-scaled and fuscous ; third segment pyriform, short-scaled and dark vinaceous brown. Frons and head light buff irrorate with dark vinaceous brown. Thorax fuscous. Abdomen light buff irrorate with pinkish buff and dark vinaceous brown ; first three segments irrorate with fuscous. Fore wing : basal fifth with costa strongly arched and shortly tufted with specialized scales, uniformly dark vinaceous brown ; terminal area suffused with olive buff ; remainder of wing pinkish buff irrorate with dark vinaceous brown, rather more densely costad ; postmedial fascia slender, curved boldly terminad in discal area and streaked basad along submedian fold, dark vinaceous brown ; distad of the postmedial fascia there are interneural, dark vinaceous streaks, except between veins R_3 and M_1 ; termen slenderly fuscous ; fringes chequered light buff and dark vinaceous brown. Hind wing : distal third pale pinkish buff ; anal margin dark olive buff ; basal and medial areas densely irrorate with dark vinaceous brown ; distad of the medial area there is a slender fascia of dark vinaceous brown, toothed to the termen posterior of vein Sc_2 and between the radial veins ; termen slenderly dark vinaceous brown ; fringes pale pinkish buff. Related to *C. subcostalis* Hampson (1893), differing in its smaller size and the sharply contrasting basal fifth of the fore wing.

MALAYA : Kedah Peak, 3,000 ft., 20.iii.1928 (*H. M. Pendlebury*), holotype ♂.

Chloroclystis oedalea sp. n.

(Pl. 40 : L)

♂♀ 18 mm. Antennae of both sexes shortly ciliate. Palpi one and one-quarter times as long as the diameter of the eye. Male. Palpus : first and second segments short-scaled, third segment with a dense tuft of scales on the undersurface, pinkish buff. Frons and head pinkish buff. Thorax and abdomen pinkish buff irrorate with dark vinaceous brown and fuscous. Fore wing : costa sharply shouldered at one-fifth ; medial three-fifths of subcostal fold pinkish cinnamon, anterior and posterior edges shortly tufted with brownish drab, specialized scaling proximally ; remainder of wing brownish drab, irrorate with fuscous in basal area and densely so in subterminal area at costa and between radial veins and at inner margin ; fuscous distal margin of medial area and a slender, white fascia parallel to and distad of it are lunulate from subcostal fold to vein R_3, almost right-angled between veins R_3 and M_1, thence straight to three-quarters inner margin. Hind wing brownish drab ; fuscous distal margin of medial area and a slender, white fascia parallel to and distad of it are strongly toothed terminad between veins R_3 and M_1 ; the white fascia is much broadened posterior of the discal fold ; subterminal fascia white, traceable only as a large spot between veins R_3 and M_1, which is connected slenderly to the tornus. Female : palpus marked as thorax ; terminal segment not tufted. Fore wing without specialized scaling and specialized subcostal fold ; dense fuscous irroration in subterminal area also wanting ; subterminal fascia pale, dentate and sharply marked ; in other respects similar to male. Related to *C. subcostalis* Hampson (1893), from which it differs in its smaller size, more uniformly coloured wings, which lack all trace of green, and in the much less sharply defined pattern.

North Borneo : Mt. Kinabalu, v-viii.1903 (*John Waterstradt*), 1 ♂, 2 ♀, including holotype and allotype.

Sarawak : (*Wallace*), 1 ♂.

Chloroclystis phoenicophaes sp. n.

(Pl. 40 : L)

♂ 15-16 mm.; ♀ 16-18 mm. Antennae in both sexes shortly ciliate. Female palpus twice as long as the diameter of the eye ; male palpus slightly shorter. Palpus, frons and head cartridge buff, outer surface of palpus and lower frons irrorate with fuscous. Thorax yellowish olive, patagia and tips of tegulae smoke gray. Abdomen cream buff (possibly discoloured yellowish olive) ; first three segments irrorate with old rose and smoke gray. Male. Fore wing : costa arched moderately at two-fifths ; ground colour yellowish olive ; basal third, anterior of subcostal vein, irrorate with flesh pink, old rose and fuscous, costa long-scaled ; proximal two-thirds of medial area, anterior of discal fold, clothed with short, specialized scales, cartridge buff tipped with fuscous and rather longer at costa ; distal third of medial area, anterior of vein M_2, old rose with the veins marked in fuscous ; postmedial fascia cartridge buff and glossy, distad of which the veins are fuscous to the termen ; distal fifth of wing, anterior of vein R_3, densely fuscous and irrorate with pale smoke gray near termen ; dentate subterminal fascia cartridge buff and glossy ; termen slenderly fuscous ; fringes broadly fuscous medially, paler distally and warm buff proximally, where the dots at the veins ends are slenderly connected. Hind wing yellowish olive ; transverse fasciae paler and faintly defined ; veins very sparsely scaled with black ; fringes very faintly warm buff proximally, otherwise concolorous with the wing. The female differs only in lacking the arched costa and the specialized scales on the fore wing. Similar in size to *C. modesta* Warren (1893) but differing in the specialization of the male fore wing and in the wing-colour of both sexes.

W. CELEBES : Paloe, G. Tompoe, 2,700 ft., i.1937 (*J. P. A. Kalis*), 2 ♂, 1 ♀, including holotype and allotype.

E. BALI : Git-Git, 5,000 ft., v.1936 (*J. P. A. Kalis*), 1 ♂, 1 ♀ ; Batoeriti, 3,500 ft., v.1936 (*J. P. A. Kalis*), 1 ♀.

Chloroclystis cuneativenis sp. n.

(Pl. 40 : L)

♂♀ 12-15 mm. Antennae of both sexes minutely ciliate. Male palpus one and one-half times, female palpus one and three-quarter times as long as the diameter of the eye. Palpus, frons and head cartridge buff, frons and palpus lightly irrorate with fuscous. Thorax cartridge buff densely irrorate with pale mouse gray. Abdomen pinkish buff, the segments edged anteriorly with pale mouse gray. Male. Fore wing : costa strongly arched at one-third and edged with moderately long hair-scales, which are a mixture of vinaceous buff and fuscous ; ground colour pale olive buff ; sub-basal and medial areas and distal fourth pale mouse gray ; medial area irregularly irrorate with fuscous, most densely on the veins at the proximal and distal margins, the distal margin being toothed mediad on the discal fold ; postmedial fascia broad, subterminal fascia slender and dentate, both pale and ill-defined, the subterminal broadly edged both proximally and distally with fuscous to fuscous black at the costa ; termen slenderly fuscous ; fringes pale mouse gray to fuscous with slenderly connected warm buff spots at the vein ends. Hind wing : termen slightly concave between vein M_2 and anal angle ; ground colour pale olive buff ; the wing is crossed from costa to anal margin by five broad, parallel, ill-defined fasciae of pale mouse gray, three are in the medial area and two in the terminal fourth ; veins very sparsely scaled with black ; fringes as on fore wing. In the female the costa is not arched nor fringed with long hair-scales. Related to the preceding species, differing in the specialized scaling of the male fore wing and in the colour and pattern of both sexes.

W. CELEBES : Paloe, G. Tompoe, 2,700 ft., i-ii.1937 (*J. P. A. Kalis*), 2 ♂, 2 ♀, including holotype and allotype ; Paloe, Koelawi, 3,100 ft., iii.1937 (*J. P. A. Kalis*), 1 ♂ ; Tjamba, near Maros, 1,500 ft., ii.1938 (*J. P. A. Kalis*), 1 ♂.

Chloroclystis pygmaeica sp. n.

(Pl. 40 : L)

♂♀ 12-13 mm. Antennae minutely ciliate, the cilia equal in length to one-quarter of the diameter of the shaft. Palpus one and one-third times as long as the diameter of the eye. Very similar in colour and pattern to the preceding species, differing from it in the pale mouse gray frons and head and the irroration of the basal third of the fore wing with fuscous. The hind wing has the termen concave in the discal fold as well as between vein M_2 and the anal angle ; the transverse fasciae are fuscous and the basal area is irrorate with fuscous.

CEYLON : (*Alston*), holotype ♂; Haputale, June, 1 ♂; *ibid.*, xi.1908, 1 ♂; Maskeliya, June, 1 ♂; Polyahawella, 1 ♂.

Chloroclystis atypha sp. n.

(Pl. 40 : L)

♂ 14 mm. Antenna ciliate, the cilia two-thirds as long as the diameter of the shaft. Palpus one and one-half times as long as the diameter of the eye, tilleul buff irrorate with fuscous. Frons and head tilleul buff. Thorax tilleul buff irrorate with smoke gray. Abdomen tilleul buff irrorate with benzo brown. Fore wing : costa slightly arched at one-fourth and shortly tufted with vinaceous buff and benzo brown hair-scales ; ground colour olive buff irrorate with light drab and benzo brown ; subterminal fascia pale, broad and ill-defined, shaded broadly with benzo brown proximally, except in the discal area, and distally with smoke gray irrorate with benzo brown ; in the distal fourth the veins are light buff ; fringes drab distally, slenderly light buff proximally. Hind wing : termen slightly crenulate ; basal area, double postmedial and single subterminal fasciae clear olive buff ; remainder of wing densely irrorate with benzo brown ; fringes as on fore wing. Related to *C. cuneativenis* Prout, from which it differs in the shorter tufting and less pronounced arching of the costa of the fore wing, the denser brown irroration of both wings and in the longer antennal ciliation.

W. CELEBES : Paloe, G. Rangkoenau, 1,800 ft., xii.1936 (*J. P. A. Kalis*), holotype ♂.

Chloroclystis dilatata hydrographica subsp. n.

(Pl. 41 : A)

Grayer in appearance than either *d. dilatata* Walker (1866) or *d. pelopsaria* Walker (1866) ; the vinaceous brown and fuscous irroration of the former and the pinkish vinaceous and fuscous irroration of the latter is wanting ; the most conspicuous marking remaining is the fuscous spot in the discal fold proximad of the subterminal fascia.

BRITISH NEW GUINEA : xii.1898 (*A. S. Meek*), 1 ♂; Hydrographer Mts., 2,500 ft., ii-v.1918 (*Eichhorn Bros.*), 4 ♂, 3, ♀, including holotype and allotype.

Chloroclystis testulata denotata (Walker) ab. ***albiplaga*** ab. n.

On the fore wing the distal three-fourths of the medial area, posterior of the median vein, are white.

NEW ZEALAND : Dunedin, 6.i.1910 (*G. Howes*), holotype ♀.

Chloroclystis testulata denotata Walker ab. ***irregulata*** ab. n.

Posterior of vein R_3 and the median vein the fore wing is light buff from one-half to seven-eighths.

NEW ZEALAND : 1894 (*G. V. Hudson*), 1 ♀; Sumner, Christchurch, 14.x.1922 (*J. W. Campbell*), holotype ♂.

Chloroclystis luciana sp. n.

(Pl. 41 : B)

Similar in size and pattern to *C. conversa* Warren (1897). On the fore wing the ground colour is duller, light yellow olive to yellow olive instead of lime green ; in the male the specialized scaling in the posterior distal fourth is not quite so extensive, scarcely reaching beyond vein M_2. In the female the ground colour of the hind wing is cartridge buff without a trace of green.

INDIA : Dharmsala, holotype ♂ and allotype ♀ ; Sabathu, viii.1889, 1 ♀.

Chloroclystis nudifunda sp. n.

(Pl. 41 : C)

Similar in size and wing-shape to *C. olivata* Warren (1901) ; the fore wing has the inner margin produced a little further posteriorly and the underside is a uniformly, glossy drab, lacking the area of russet scaling in the posterior proximal fourth of that species. The hind wing is white, the termen and inner margin narrowly lime green irrorate with fuscous ; the specialized, russet scaling, which occupies the cell area in *olivata*, is wanting.

MALAYA : Pahang, Cameron Highlands, 5,500 ft., 21.vi.1935 (*H. M. Pendlebury*), holotype ♂.

Chloroclystis semiscripta brychoma subsp. n.

Differs from *s. semiscripta* Warren (1906) in the extensive black irroration in the cell area of the fore wing, especially immediately proximad and distad of the postmedial fascia. In the female the hind wing is broadly and strongly banded with fuscous at the termen.

W. CELEBES : Paloe, Rangkoenau, 1,800 ft., xii.1936, 1 ♂, 2 ♀ ; Paloe, G. Tompoe, 2,700 ft., i-ii.1937, 14 ♂, 44 ♀ including holotype and allotype ; Paloe, Koelawi, 3,100 ft., iii.1937, 1 ♂, 1 ♀ ; Paloe, Lindoe, 3,700 ft., iv.1937, 4 ♂, 24 ♀ ; Paloe, Loda, 4,000 ft., v.1937, 1 ♂, 4 ♀ ; Paloe, Sidaonta, 4,500 ft., vi.1937, 5 ♀.

SW. CELEBES : G. Lampobattang, Parang-bobo-Goa, 5,000 ft., v.1938, 1 ♂, 2 ♀.

E. CELEBES : Ulu Kolaka, 500 m., v-vi.1939, 3 ♂, 10 ♀.

All specimens were collected by *J. P. A. Kalis.*

Chloroclystis palmaria phantastes subsp. n.

Differs from *p. palmaria* Prout (1928) in the hind wing of the female. The ground colour is white ; the termen is very lightly irrorate with dark olive buff ; two dark, transverse fasciae are weakly marked at one-third and two-thirds respectively ; a third is marked at the anal margin only.

JAVA : Gedeh, 7,500 ft., 24-25.vi.1910 (*E. A. Cockayne*), holotype ♂ and allotype ♀ ; Rés. Soekaboemi, 1895 (*J. B. Ledru*), 2 ♂ ; *ibid.*, 2,000 ft., 1893 (*H. Fruhstorfer*), 1 ♂ ; Mons Tjikorai, 4,000 ft., 1892 (*H. Fruhstorfer*), 1 ♂.

Chloroclystis permixta sp. n.

(Pl. 41 : D)

♂♀ 24-28 mm. Male antenna minutely ciliate ; female antenna filiform. Male palpus twice as long as the diameter of the eye ; female palpus a little longer. Palpus, frons, head, thorax and abdomen olive ocher to yellowish olive ; palpus tipped with white ; tegulae irrorate with black ; first abdominal segment black, other segments sometimes irrorate with black. Male. Fore wing : termen incurved posterior of vein M_1 to a rounded tornus ; basal eighth olive ocher to yellowish olive, distad of which is an area of mixed, specialized scaling, the distal margin of which extends diagonally from three-eighths costa to the tornus ; the subcostal part is long-scaled and olive buff, the medial part, which extends posteriorly to vein M_2, is short-scaled and bister sometimes mixed with buffy brown and the posterior part is black and short-scaled ; distal fourth of wing, anterior of vein R_3, densely irrorate with vinaceous brown and black, edged proximally by a double, sinuous, black fascia and divided by the pale, dentate subterminal fascia ; posterior of vein M_2 the wing is slenderly coloured as apex ; remainder of wing olive ocher to yellowish olive. Underside : proximal two-thirds, anterior of submedian fold, faintly suffused with deep olive buff, the costa irrorate with black; apex pale brownish drab ; remainder tilleul buff lightly suffused with deep olive buff. Hind wing very densely covered with short scales, cartridge buff costally shading to buffy brown at anal margin. Underside : a slender, black postmedial fascia curves almost parallel to distal margin, from one-half costa to anal angle ; distad of this fascia the wing is densely covered with short, deep olive buff scales ; proximad of it and posterior of the subcostal vein, the wing is densely covered with specialized, erect scales, buffy brown anteriorly, shading posteriorly to fuscous ; remainder of wing very thinly scaled, tilleul buff. Female. Fore wing : olive ocher to yellowish olive, lightly irrorate with vinaceous brown in discal area ; basal, medial and terminal areas darker but ill-defined ; veins streaked with black proximad of the subterminal fascia. Hind wing cartridge buff to light buff and glossy ; transverse fasciae faintly marked by sparse, black irroration. Underside of both wings olive ocher to yellowish olive ; three dark, transverse fasciae marked weakly on each wing. Related to *C. analyta* Prout (1928), differing in the specialized scaling of the male and the colour and pattern of the wings of both sexes.

JAVA : Arunjo, 3,000 ft. (*W. Doherty*), 1 ♀ ; Nongkodjadjar, 4,000 ft., vi.1934 (*J. P. A. Kalis*), 1 ♂, 6 ♀ ; Tengger, Singolangoe, 5,000 ft., vi.1934 (*J. P. A. Kalis*), 2 ♂, 4 ♀ ; Tengger, Kletak, 6,000 ft., vi.1934 (*J. P. A. Kalis*), 1 ♂, 3 ♀, including holotype and allotype.

Chloroclystis filicata mochleutes subsp. n.

Differs from *f. filicata* Swinhoe (1892) in the suppression of the dark, terminal shading in the discal area and posterior of vein M_2 ; the distal margin of the medial area is less sharply dentate.

Ab. ***epacta*** ab. n.

One of the two females from Tjamba and the female from G. Lampobattang have both wings suffused with light hellebore green.

SW. CELEBES : Tjamba, near Maros, 1,500 ft., ii.1938 (*J. P. A. Kalis*), holotype ♂, 2 ♀; G. Lampobattang, Parang-bobo-Goa, 5,000 ft., v.1938 (*J. P. A. Kalis*), 1 ♂, 1 ♀.

W. CELEBES : Paloe, G. Rangkoenau, 1,800 ft., xii.1936 (*J. P. A. Kalis*), 1 ♀; Paloe, G. Tompoe, 2,700 ft., i.1937 (*J. P. A. Kalis*), 1 ♀; Paloe, Lindoe, 3,700 ft., iv.1937 (*J. P. A. Kalis*), 2 ♀.

Chloroclystis dissographa sp. n.

(Pl. 41 : E)

♂♀ 19-22 mm. Both male and female antennae minutely ciliate. Palpi twice as long as the diameter of the eye, second and third segments with long, anteriorly projecting scales ; first and second segments light buff, the upper surface sometimes dark greenish glaucous ; basal segment irrorate with black ; terminal segment white on upper surface, otherwise black. Frons, head and patagia dark greenish glaucous. Thorax cartridge buff to light buff (perhaps discoloured green) irrorate with iridescent black, the tegulae irrorate with dark glaucous green. Abdomen light to cartridge buff, second and third tergites densely irrorate, first, sixth and seventh tergites usually edged posteriorly with iridescent black. Male. Fore wing : distal fifth of inner margin shallowly concave and tufted with light buff hair-scales ; ground colour dark greenish glaucous ; basal half irrorate with pinkish vinaceous and black ; basal fascia broad, antemedial fascia slightly bowed mediad, very broad and densely black ; postmedial fascia pale and edged both proximally and distally and divided by slender, parallel, black lines ; subterminal fascia pale and dentate, edged proximally by a broad, black shade irrorate with pinkish vinaceous ; this subterminal shade is densely black and especially strongly marked between two-thirds and five-sixths costa ; termen slenderly black ; fringes chequered fuscous and olive buff. Hind wing cartridge buff and glossy ; anal margin light buff with a small flap folded on to upper surface between one-half and three-quarters ; proximal half of anal margin edged with long hair-scales ; distal fourth edged with very short, apressed scales. In the female both wings are simple ; hind wing light buff ; terminal area lightly suffused and transverse fasciae faintly fuscous. Related to *C. seminotata* Warren (1898), but distinguished from it by the very broad, antemedial fascia on the fore wing of both sexes and by the specialized fore wing of the male.

E. JAVA : Nongkodjadjar, 4,000 ft., vi.1934, 1 ♀; Waterfall Baeong, vii.1934, 1 ♂.

E. BALI : Batoeriti, 3,500 ft., vi.1935, 2 ♂, 2 ♀; Git-Git, 5,000 ft., v.1936, 1 ♀.

W. CELEBES : Paloe, G. Rangkoenau, 1,800 ft., xii.1936, 2 ♀; Paloe, G. Tompoe, 2,700 ft., ii.1937, 4 ♀; Paloe, Lindoe, 3,700 ft., iv.1937, 1 ♀.

SW. CELEBES : G. Lampobattang, Parang-bobo-Goa, 5,000 ft., v.1938, 8 ♂, 17 ♀, including holotype and allotype.

All specimens were collected by *J. P. A. Kalis.*

Chloroclystis craspedozona sp. n.

(Pl. 41 : F)

♀ 18-19 mm. Antenna minutely ciliate. Palpus two and one-half times as long as the diameter of the eye ; second segment long, third segment very slender. Frons cartridge buff. Head pistachio green edged anteriorly and posteriorly with black. Thorax fuscous edged posteriorly with iridescent black ; patagia and tegulae irrorate with pistachio green and vinaceous brown. Abdomen : first tergite white ; second tergite vinaceous brown, both edged anteriorly with iridescent black ; remaining tergites buff (probably discoloured green), seventh tergite irrorate with iridescent black. Fore wing pistachio green ; basal area broad ; basal fascia black ; medial area with four or five slender, black, transverse fasciae, which are obsolescent posterior of median vein, merging with black irroration ; cell spot large ; subterminal fascia pale and dentate, proximad of which is a broad shade of vinaceous brown and distad of which there are black, interneural streaks ; termen slenderly black ; fringes chequered pistachio green and black. Hind wing tilleul buff ; termen narrowly suffused with pistachio green ; three transverse fasciae, faintly drab. Related to *C. palpata* Walker (1862), differing in its smaller size and in pattern ; the white, first abdominal tergite and the medial area with its strongly marked anterior half and obsolescent posterior half are distinctive.

E. BALI : Batoeriti, 3,500 ft., vi.1935 (*J. P. A. Kalis*), 4 ♀, including holotype ; Git-Git, 5,000 ft., iv-v.1936 (*J. P. A. Kalis*), 2 ♀.

Chloroclystis craspedozona venata subsp. n.

♀ 21 mm. Differs from the nominate subspecies in the clearly defined and entire fasciae and lack of irroration in the medial area ; the white, punctiform postmedial fascia is marked on the veins only ; radial veins streaked with white proximad of subterminal fascia, which is white and dentate.

PHILIPPINE Is.: Luzon, subprov. Benguet, Pauai, Haights' Place, 7,000 ft., 1.xii.1912 (*A. E. Wileman*), holotype ♀.

Chloroclystis craspedozona heanis subsp. n.

(Pl. 41 : H)

Differs from the nominate subspecies in the green basal area, in the basal and subterminal fasciae and the subcostal region of the medial area, which are irrorate with pinkish vinaceous and in the sub-basal fascia, which is cartridge buff.

CENTRAL CERAM : Manusela, 6,000 ft., x-xii.1919 (*C. F. & J. Pratt*), holotype ♀.

Chloroclystis palpata diechusa subsp. n.

(Pl. 41 : G)

The broad, basal fascia, the medial area and the subterminal band are evenly irrorate with fuscous and clearly defined ; the remainder of the wing is clear green devoid of fuscous irroration.

INDIA : Khasia Hills (*Native coll.*) ; ii.1894, 2 ♂ ; iii.1894, 3 ♂, including holotype ; iv.1894, 2 ♂ ; vi.1895, 1 ♀ ; without date, 3 ♂, 4 ♀.

Chloroclystis palpata javana subsp. n.

(Pl. 41 : G)

Differs from *p. palpata* Walker (1862) in the pale, cartridge buff hind wing.

E. JAVA : Mt. Moenggal, 9,000 ft., i.1934 (*J. P. A. Kalis*) holotype ♂ and allotype ♀.

JAVA : Rés. Soekaboemi, 1895 (*J. B. Ledru*), 10 ♂, 16 ♀; Mons Gede, 8,000 ft. viii.1892 (*H. Fruhstorfer*), 2 ♂, 1 ♀; Gedeh, 25.vi.1910 (*E. A. Cockayne*), 1 ♂.

Chloroclystis r. regularis (Warren) ab. ***tenuabilis*** ab. n.

(Pl. 41 : G)

Proximal five-sixths of fore wing cream buff, the pattern very sharply defined and contrasted; basal and antemedial fasciae slender and black; sub-basal area broad anterior of median vein then narrowing, black irrorate with vinaceous pink; distad of the cell spot the medial area is densely black.

MALAYA : Selangor, Bukit Kutu, 3,500 ft., 16.iii.1936 (*H. M. Pendlebury*), holotype ♂.

Chloroclystis regularis viridimargo subsp. n.

(Pl. 41 : H)

♂ 24 mm. Larger and longer-winged than *r. regularis* Warren (1895). Fore wing with transverse bands sharply defined proximally; postmedial fascia less crenulate; distal third of wing predominently clear forest green with only slight, mainly linear, posterior extension of the fuscous spot at four-fifths costa; distal seventh lightly irrorate with fuscous in discal area.

MALAYA : Perak, 2,000-3,500 ft. (*W. Doherty*), holotype ♂.

Chloroclystis diaboeta sp. n.

(Pl. 41 : H)

♀ 25 mm. Related to *C. regularis* Warren (1895), which it closely resembles in palpus, colour and pattern; much larger than that species; head and thorax of the same green colour; second tergite of abdomen similarly vinaceous pink, remaining segments more densely irrorate with fuscous. Fore wing : sub-basal fascia almost right-angled in cell; postmedial fascia broad and double, proximal line pale olivine, slender and deeply lunulate, distal line broader, less deeply lunulate and duller green, except anterior of discal fold; distal end of cell and radial veins pinkish buff (this may be discoloration due to the action of moisture, but is present in both wings); oblique brownish vinaceous streak from apex rather broad. Hind wing somewhat grayer than in *r. regulosa*.

CENTRAL CERAM : Manusela, 6,000 ft., x-xii.1919 (*C. F. & J. Pratt*), holotype ♀.

Chloroclystis viridata phaeina subsp. n.

(Pl. 41 : H)

Differs from *v. viridata* Warren (1895) in the intensification of the green colouring both proximad and distad of the medial area on the fore wing and distad of the postmedial fascia on the hind wing.

W. CELEBES : Paloe, G. Tompoe, 2,700 ft., ii.1937 (*J. P. A. Kalis*), 3 ♀, including holotype.

Chloroclystis diaschista sp. n.

(Pl. 41 : H)

♂ 24 mm. Antenna ciliate, the cilia one-third as long as the diameter of the shaft. Palpus two and one-quarter times as long as the diameter of the eye, second segment very long. Palpus, frons, head, thorax and abdomen cream buff ; tegulae irrorate with black ; abdomen irrorate with vinaceous brown and black and with a black, medio-dorsal spot at the posterior margin of each of the first six tergites. Fore wing light cress green, in part discoloured to cream buff and patterned in black ; basal fascia broad, marked at costa only ; sub-basal, ante- and postmedial fasciae marked broadly at costa and inner margin, failing medially ; subterminal shade, toothed strongly terminad and irrorate with vinaceous buff, broken between veins Sc_5 and R_1 and between R_3 and M_1 ; terminal spots at vein ends black. Hind wing tilleul buff ; termen broadly suffused with drab and intensified proximad of the faint, pale subterminal fascia ; postmedial fascia marked posterior of vein M_2 only ; cell spot drab. Related to *C. palpata* Walker (1862), but differing in the distinct pattern of the fore wing.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂.

Chloroclystis subpalpata sp. n.

(Pl. 41 : I)

♂♀ 15-18 mm. A small, glossy species with colour and pattern similar to that of *C. palpata* Walker (1862). In the male there is a small, hyaline patch just distad of the areole on the underside of the fore wing, wanting in *palpata*. The termen of the hind wing is faintly waved in the male, more so (about as in *C. rufitincta* Warren (1898)) in the female. Palpus twice as long as the diameter of the eye, second segment rough-scaled and black anteriorly, third segment elongate and black. A further appreciable difference from *palpata* is that the postmedial fascia is weakly inclined basad at the costa.

MALAYA : Selangor, Bukit Kutu, 3,500 ft., 17.iii.1931 (*H. M. Pendlebury*), holotype ♂ ; Kedah Peak, 3,300 ft., 26.iii.1928 (*H. M. Pendlebury*), 1 ♀ ; Pahang, Cameron Highlands, 4,800 ft., 12.x.1923 (*H. M. Pendlebury*), 1 ♀ ; *ibid.*, 23-24.vi.1935, 1 ♂, 1 ♀.

Chloroclystis subpalpata fractiscripta subsp. n.

(Pl. 41 : I)

♂ 18 mm.; ♀ 19 mm. In the male the posterior, distal fourth of the medial area is pinkish buff and only the anterior half of the postmedial fascia is marked. In the female a broad, pinkish buff streak extends from base of wing to subterminal fascia, passing through the posterior half of the discal area.

PHILIPPINE IS.: Luzon, subprov. Benguet, Pauai, Haights' Place, 7,000 ft., (*A. E. Wileman*); holotype ♂, 27.xi.1912; allotype ♀, 8.xi.1912.

PLATE 29

Row A

Melanthia d. dentistrigata (Warren 1893)
M. dentistrigata leucansis Prout 1939
M. exquisita (Warren 1893)
Acodia pauper (Rosenstock 1885)
Xanthorhoe frivola Meyrick 1913
Scotocyma a. albinotata (Walker 1866)

Row B

Scotocyma a. albinotata (Walker) ab. *platydesma* (Lower 1894)
S. albinotata scotopepla Prout 1940
S. legalis (Warren 1896)
S. miscix Prout 1934
Gnamptopteryx perficita (Walker 1858)

Row C

Parapalta aurifera circumfumata (Prout 1916)
P. semiviridis (Joicey & Talbot 1917)
Lampropteryx maia Prout 1940
L. a. argentilineata (Moore 1867)
L. argentilineata nitidaria (Leech 1897)

Row D

Lampropteryx neelys Prout 1922 as *neelis*
L. synthetica Prout 1922
L. rotundaria (Leech 1897)
L. siderifera (Moore 1888)
L. opistholasia Prout 1926

Row E

Lampropteryx dispar (Warren 1897)
L. moroessa (Prout 1932)
L. c. chalybearia (Moore 1867)
L. chalybearia incola (Bastelberger 1911)
Electrophaes tsermosaria (Oberthur 1893)

Row F

Electrophaes niveonotata (Warren 1901)
E. cryopetra Prout 1940
E. perpulchra (Butler 1886)
E. chrysophaes Prout 1923
E. zaphenges Prout 1940
E. aggrediens Prout 1940

Row G

Electrophaes cyria Prout 1940
E. moltrechti Prout 1940
E. nigrifulvaria (Hampson 1902)
E. albipunctaria (Leech 1897)
E. euryleuca Prout 1940

Row H

Electrophaes ephoria Prout 1940
E. niveopicta (Warren 1893)
E. intertexta (Warren 1893)
E. fervidaria (Leech 1897)
E. subochraria (Leech 1897)

Row I

Electrophaes westi Prout 1931
Melitulias graphicata (Walker 1861)
M. leucographa Turner 1922
M. oriadelpha Turner 1926
M. glandulata (Guenée 1858)
M. parallela Prout 1940
M. discophora Meyrick 1891

Row K

Spectrobasis plumosa Warren 1907
S. maligna Warren 1907
S. differens Warren 1907
S. conferens Prout 1940
S. viridis Warren 1906
S. rufa Warren 1906
S. impectinata Prout 1916

PLATE 30

Row A

Lasioedma floccosa Warren 1907
L. purpureorufa Rothschild 1915
Crasilogia simplex Warren 1906
Protaulaca scythropa Meyrick 1891
P. subflava Warren 1907
Crasilogia fumipennis Warren 1906

Row B

Polyclysta hypogrammata Guenée 1858
Crasilogia flavipennis Warren 1907
C. fulvitincta Joicey & Talbot 1917
C. dispar Warren 1903
Polyclysta gonycrota Prout 1932
Heterochasta conglobata (Walker 1862)

Row C

Sibatania mactata arizana (Wileman 1911)
Ecliptopera mixtilineata (Hampson 1895)
E. decurrens (Moore 1888)
E. recordans Prout 1940
E. umbrosaria stathera Prout 1940

Row D

Ecliptopera lucrosa Prout 1940
E. substituta (Walker 1866)
E. oblongata (Guenée 1858)
E. dentifera (Moore 1888)
E. relata (Butler 1880)

Row E

Ecliptopera zaes Prout 1932 as *sais*
E. litterata (West 1929)
E. benigna (Prout 1914)
E. dissecta (Moore 1887)

Row F

Ecliptopera delecta (Butler 1880)
E. leucoglyphica (Warren 1898)
E. sagittatoides (Pagenstecher 1900)
E. rectilinea Warren 1894
E. triangulifera (Moore 1888)

Row G

Ecliptopera fulvidorsata (Swinhoe 1894)
E. furva (Swinhoe 1891)
E. furvoides (Thierry-Mieg 1915)
E. subapicalis (Hampson 1891)
E. muscicolor (Moore 1888)

Row H

Ecliptopera subnubila Prout 1940
E. ctenoplia Prout 1931 as *ctenophia*
E. odontoplia Prout 1935
Eustroma elista Prout 1940
E. aurantiaria (Moore 1867)

Row I

Ecliptopera zophera Prout 1931
E. obscurata (Moore 1867)
E. thalycra Prout 1928
Eustroma inextricata (Walker 1866)
E. aerosa (Butler 1878)

PLATE 31

Row A

Eustroma hampsoni sp. n. as *interplagata*
E. promacha Prout 1940
E. m. melancholica (Butler 1878)
E. melancholica venipicta Warren 1893

Row B

Eustroma fractifasciaria Leech 1897
E. lativittaria (Moore 1867)
Paralygris contorta Warren 1900
Pareustroma fissisignis (Butler 1880)
P. propriaria (Leech 1897)

Row C

Eustroma metaria (Oberthur 1893) as *metoria*
Pareustroma conisecta Prout 1940
Hysterura literataria (Leech 1897)
H. cervinaria (Moore 1867)
H. vacillans Prout 1940 as *villicans*

Row D

Lobogonodes porphyriata (Moore 1888)
L. multistriata tensa Prout 1940
L. complicata dactylotypa Prout 1940
L. taiwana (Wileman & South 1917)
Hysterura multifaria (Swinhoe 1889)
H. protagma Prout 1940

Row E

Amnesicoma albiseriata (Warren 1893)
A. bicolor (Moore 1888)
Photoscotosia indecora Prout 1940
P. tonchignearia (Oberthur 1893)
P. albapex (Hampson 1895)

Row F

Photoscotosia amplicata (Walker 1862)
P. dejeani (Oberthur 1893)
P. chlorochrota Hampson 1902 as *chlorochota*
P. undulosa (Alphéraky 1888)
P. prosenes Prout 1940

Row G

Photoscotosia fulguritis Warren 1893
P. multilinea Warren 1893
P. dipegaea Prout 1940
P. multiplicata Warren 1898

Row H

Photoscotosia velutina Warren 1895
P. atromarginata Warren 1893 as *atromarginaria*
P. nubilata (Moore 1888)
P. annubilata Prout 1940 as *denubilata*

PLATE 32

Row A

Photoscotosia polysticha Prout 1940
P. atrostrigata (Bremer 1864)
P. insularis Bastelberger 1909 ♂
P. insularis Bastelberger 1909 ♀

Row B

Photoscotosia m. miniosata (Walker 1862)
P. miniosata cupha Prout 1931
P. isosticta Prout 1940
P. prasinotmeta Prout 1940

Row C

Photoscotosia dejuta Prout 1937
P. funebris Warren 1895
P. obliquisignata (Moore 1867)
P. metachryseis Hampson 1896

Row D

Callabraxas amanda Butler 1880
Calleulype compositata basistrigaria (Wileman 1912)
Eucosmabraxas octoscripta (Wileman 1912)
Chartographa ludovicaria praemutans (Prout 1937)

Row E

Gandaritis flavata Moore 1867
G. s. sinicaria Leech 1897
G. sinicaria postalba Wileman 1920

Row F

Chartographa convexa (Wileman 1912)
Lygris flavomacularia (Leech 1897)
L. agnes subalba (Wileman 1912)
L. albicinctata Pungeler 1909

Row G

Lygris pulchraria (Leech 1897)
Cidaria ochracearia Leech 1897
Dysstroma cinereata (Moore 1867)
D. fumata (Bastelberger 1911)
D. imitaria Heydem ab. *rufescens* ab. n.

Row H

D. incolorata Heydemann 1929
D. calamistrata (Moore 1867)
D. rufibrunnea (Warren 1900)
D. pendleburyi Prout 1932
D. heydemanni Prout 1931

Row I

Dysstroma subapicaria (Moore 1867)
D. planifasciata Prout 1914
D. corussaria (Oberthur 1880)
D. tenebricosa Heydemann 1929
D. tenebricosa Heydemann ab. *albonigrata* Heydemann 1932

PLATE 33

Row A

Dysstroma albiangulata (Warren 1893)
D. cuneifera (Warren 1898)
D. ceprona (Swinhoe 1902)
Heterothera sororcula (Bastelberger 1909)
Thera cyphoschema Prout 1926
T. atrinotata reducta (Joannis 1929)

Row B

Thera etes Prout 1926
Dysstroma singularia Heydemann 1929
Thera dentifasciata (Hampson 1895)
T. comitabilis Prout 1923
Philereme vashti (Butler 1878)

Row C

Triphosa consona Prout 1926
T. corrasata Warren 1897
T. oenozona Prout 1923
T. acyrota Prout 1941

Row D

Triphosa rubrodotata (Walker 1862)
T. largeteauaria (Oberthur 1881) as *largetauaria*
T. venimaculata (Moore 1867)
T. expansa (Moore 1888)

Row E

Triphosa lugens Bastelberger 1909
T. rantaizanensis Wileman 1916
T. praesumtiosa Prout 1941
T. acutipennis Warren 1896

Row F

Triphosa pallescens Warren 1896
T. nigralbata (Warren 1888)
T. albiplaga (Oberthur 1887)
T. dubiosata (Walker) ab. *variegata* Prout 1914
T. confusaria (Leech 1897)

Row G

Triphosa empodia Prout 1941
T. dubiosata (Walker 1862)
T. macroprora Prout 1941
T. confusaria tarachodes Prout 1941
T. tremulata multilinearia (Leech 1897)

Row H

Triphosa luteimedia Prout 1941
T. seseraria (Oberthur 1893)
T. moniliferaria (Oberthur 1893)
T. melanoplagia (Hampson 1902)
Calocalpe alternata (Staudinger 1896)

PLATE 34

Row A

Calocalpe tremodes Prout 1941
C. anestia Prout 1941.
C. titubata Prout 1941
C. valentula Prout 1941 as *inanis*

Row B

Calocalpe tristis Prout 1914
C. tristis Prout ab. *bicolor* Prout 1914
C. inanata (Christoph 1881)
C. hypolopha (Hampson 1895)

Row C

Calocalpe marmoraria (Leech 1897)
C. abraxidia (Hampson 1895)
C. flavipes (Ménéntriés 1858)
Stamnodes spectatissima Prout 1941

Row D

Stamnodes depeculata lamarum Prout 1941
S. elwesi Alphéraky 1895
Palaeomystis falcataria (Moore 1867)
Docirava affinis Warren 1894
D. aequilineata Walker 1863

Row E

Docirava distata Prout 1941
D. flavilinata Wileman 1915
D. fulgurata (Guenée 1858)
Carsia emphracta Prout 1941
Asaphodes parora (Meyrick 1884)

Row F

Asaphodes megaspilata (Walker 1862)
A. amblyterma Meyrick 1931
Loxofidonia rufescens (Butler 1879)
L. stephanitis (Meyrick 1907)
L. cingala (Moore 1887)
L. obfuscata (Warren 1893)
L. rufescens (Butler) ab. *falcata* (Butler 1879)

Row G

Loxofidonia b. bareconia (Swinhoe 1894)
L. bareconia pallidistriga Prout 1937
L. sigmata Prout 1941
L. taiwana (Wileman 1914)
L. buda (Swinhoe 1895)
L. plumbilinea (Warren 1906)
Scordonia lamae (Alphéraky 1897)

Row H

Eulype scotaria (Hampson 1907)
E. lugens (Oberthur 1886)
Eustroma aurigena (Butler 1880)
Pareustroma fissisignis chrysoprasis (Oberthur 1884)
Photoscotosia penguionaria (Oberthur 1893)

Row I

Electrophaes chimakaleparia (Oberthur 1893) as *chimacaleparia*

Cidaria fulvata nugata Felder 1875
Eulype chinensis (Leech 1897)
Electrophaes aliena (Butler 1880)
Asaphodes abrogata (Walker 1862) as *mesodonta*
Lithostege inanis Prout 1941 as *abrogata*

PLATE 35

Not issued

PLATE 36

Row A

Sterrhochaeta pictipennis (Warren 1906)
S. semiradiata (Warren 1907)
S. lamia Prout 1941
S. r. rectilineata (Warren 1898)
S. rectlineata diffidens Prout 1941
S. ruptistriga (Warren 1906)
S. argyrastrape Prout 1916

Row B

Sterrhochaeta tanaorrhina Prout 1941
S. fulgurata (Warren 1906)
S. flexilinea (Warren 1906)
S. discinota (Warren 1906)
S. distorta (Warren 1906)
S. constellata (Warren 1906)
S. aphanisis Prout 1941
S. splendens (Warren 1906)

Row C

Sterrhochaeta olivacea (Rothschild 1915)
S. subtilis (Prout 1916)
S. subrubescens (Warren 1906)
S. lineola (Warren 1903)
S. biflexa Prout 1941
S. leucosphena Prout 1941
S. subcaesia (Warren 1906)
S. auratisquama (Warren 1907)

Row D

Xenoclystia delicata Warren 1906
X. delectans Warren 1906
X. nigroviridata (Warren 1896)
X. unijuga Prout 1926
X. phaeoloma Prout 1926
Desmoclystia abata Prout 1941
D. unipuncta (Warren 1906)
D. humerata (Warren 1906)

Row E

Desmoclystia hirticosta (Warren 1907)
D. nigribasis (Warren 1906)
D. prouti Sick 1941
Sterrhochaeta abbreviata Prout ab. *continuata* Sick 1941
Desmoclystia abbreviata Prout 1941
D. rubecula (Warren 1906)
Sterrhochaeta antennata (Warren 1906)
Desmoclystia fulvistriga (Warren 1906)
D. prodiga (Warren 1907)

Row F

Desmoclystia oniria Prout 1941
D. aypna Prout 1941
D. falsidica (Warren 1903)
D. prodicia Prout 1923
D. *cnecoplaca* Prout 1929
Apithecia viridata reliquifascia Prout 1926
A. viridata wilemani Prout 1931

Row G

Piercia subviridis (Hampson 1902)
P. mononyssa (Prout 1926)
P. viridiplana (Bastelberger 1911)
P. imbrata (Guenée 1858)
P. fumataria verticata (Warren 1901)
Chaetolopha incurvata (Moore 1888)
C. rubicunda (Swinhoe 1902)
C. flavicorpus (Warren 1906)

Row H

Chaetolopha coerulescens (Warren 1906)
C. turbinata Prout 1941
C. tafa Prout 1941.
C. o. ornatipennis (Warren 1906)

C. synclinogramma (Prout 1916)
C. decipiens (Butler 1886)
C. emporias (Turner 1904)
C. leucophragma (Meyrick 1891)

Row I

Chaetolopha oxyntis (Meyrick 1891)
Propithex g. glaucisparsa Prout 1932
P. tristriata (Warren 1906)
P. alternata Warren 1899
Hypenorhynchus erectilineata (Moore 1888)
Carbia nexilinea (Warren 1898) as *flavimaculata*
Pardodes f. flavimaculata Warren 1896 as *calescens*
Carbia calescens Walker 1866 as *nexilinea*

Row K

Carbia calefacta Prout 1941
C. moderata (Walker 1866)
Chaetolopha ornatipennis nepenthes Prout 1941
Pomasia sparsata Hampson 1902
P. denticlathrata Warren 1893
P. parerga Prout 1941
P. vernacularia Guenée 1858

Row L

Pomasia punctaria Hampson 1912
P. reticulata Hampson 1895
P. obliterata (Walker 1866)
P. pulchrilinea (Walker 1866)
P. psylaria Guenée 1858
P. euryopis Meyrick 1897
Eccymatoge callizona (Lower 1894)

PLATE 37

Row A

Eccymatoge callizona (Lower) ab. *abiens* Prout 1941
Collix leuciota Prout 1929
C. haploscelis Prout 1925
C. suffusca Warren 1907
C. adamata Prout 1941

Row B

Collix blosyra Prout 1926
C. stellata Warren 1894 as *rufipalpis*
C. rufipalpis (Hampson 1907) as *stellata*
C. g. griseipalpis Wileman 1916
C. griseipalpis phaeochiton Prout 1932

Row C

Collix rhabdoneura Prout 1941
C. purpurilita Prout 1925
C. basicristata Prout 1923
C. hypospilata Guenée 1858
C. hypospilata Guenée underside

Row D

Collix praetenta Prout 1929
C. examplata Warren 1906
C. mesopora Prout 1932
C. g. ghosha Walker 1862 as *gosha*
C. subligata Warren 1896

Row E

Collix dichobathra Prout 1931
C. lasiospila (Meyrick 1886)
C. r. rufidorsata Prout 1929
C. elongata Warren 1902
C. multifilata Warren 1896
Horisme elachista (West 1929)

Row F

Horisme subradiata (Warren 1907)
H. brooksi Prout 1941
Collix stenoplia Prout 1929
Horisme flavofasciata (Moore 1888)
H. hirtivena (Warren 1906)

Row G

Horisme intrepida Prout 1932
H. erythroides Prout 1941
H. angustipennis (Warren 1906)
H. ustimacula (Warren 1906)
H. h. hyperythra (Hampson 1895)
H. olivata (Warren 1901)

Row H

Horisme b. boarmiata (Snellen 1881) ♂
H. b. boarmiata (Snellen) ♀
H. boarmiata leprosa (Hampson 1891)
H. boarmiata leprosa (Hampson) ab. *suffusa* (Hampson 1891)
H. xylinata (Warren 1906)
H. semirufata (Warren 1906)

Row I

Horisme steretica Prout 1941
H. subrubescens (Warren) ab. *despicienda* (Butler 1889)
H. cristata (Walker 1866)
H. mortuata (Guenée 1858)
H. leucophanes (Meyrick 1891)
H. scotodes (Turner 1904)
H. rufipicta (Hampson 1895)

Row K

Horisme arenosus (Howes 1910)
H. gobiata (Felder 1875) ♂
H. gobiata (Felder) ♀
H. anguligera (Butler 1879)
H. anguligera (Butler) ab. *bipartita* Prout 1941

PLATE 38

Row A

Horisme plurilineata (Moore 1888)
H. genuflexa Prout 1923
H. murudensis Prout 1926
H. brunneata (Warren 1906)
H. leucotmeta Prout 1923
H. notata (Rothschild 1915)

Row B

Horisme illustris Prout 1916
H. symmetrozona Prout 1923
H. chlorodesma (Meyrick 1886)
H. albicristata (Warren 1906)
H. griseata (Warren 1906)
H. contaminata (Warren 1906)
H. labeculata Prout 1932

Row C

Horisme rufilunata (Warren 1906)
H. lichenosa (Warren 1906)
H. disrupta (Warren 1906)
H. aeolotis Prout 1916
H. caliginosa (Warren 1907)
H. albimedia (Warren 1906)
Parazoma s. semifusca (Warren 1896)

Row D

Parazoma semifusca swanni Prout 1941
P. ferax Prout 1926
P. hypobasis Prout 1931
Physetobasis annulata (Hampson 1891)
P. griseipennis (Moore 1888)
P. heliocoma Meyrick 1897

Row E

Physetobasis d. dentifascia Hampson 1895
P. dentifascia rectipendens subsp. n.
Eupithecia craterias (Meyrick 1899) as *cratenas*
E. prasinombra (Meyrick 1899)

Row F

Eupithecia dryinombra (Meyrick 1899)
E. phaeocausta (Meyrick 1899)
E. ruficorpus (Warren 1897)
E. acutangula Hampson 1895
E. raniata sp. n.

Row G

Eupithecia taiwana Wileman & South 1917
E. anasticta Prout 1926
E. rigida Swinhoe 1892
E. unitaeniata (Warren 1906)
E. deviridata (Warren 1907)
E. placens (Warren 1906)
E. rajata Guenée 1858
E. spilocyma Prout 1931

Row H

Eupithecia russeola Prout 1926
E. robiginascens Prout 1926
E. circumacta sp. n.
E. tricrossa Prout 1926
E. albibaltea sp. n.
E. pyricoetes sp. n.
E. hemileuca Hampson 1895

Row I

Eupithecia acyrtoterma Prout 1926
E. tenuisquama (Warren 1896)
E. infestata Swinhoe 1889
E. quadripunctata Warren 1888
E. karapinensis Wileman & South 1917
E. albispumata Warren 1893
E. peguensis sp. n.

Row K

Eupithecia nigrinotata Swinhoe 1895
E. costipicta Warren 1893
E. niveivena Prout 1926
E. rubridorsata Hampson 1895
E. albigutta sp. n.
E. ustata Moore 1888
E. fulcrata sp. n.

Row L

Eupithecia leucenthesis Prout 1926
E. asema Hampson 1891
E. albifurva Hampson 1907
E. m. mundiscripta (Warren 1907)
E. leucostaxis Prout 1926
E. ochracea (Warren 1888)
E. leucospila (Swinhoe 1906)
E. melanolopha Swinhoe 1895
E. compsodes (Meyrick 1891)

PLATE 39

Row A

Eupithecia excita sp. n.
E. latimedia Hampson 1895
E. lineosa Moore 1888
E. infuscata (Warren 1899)
E. irambata (Warren 1893)
E. wardi sp. n.
E. costalis (Walker 1863)

Row B

Eupithecia albisecta (Warren 1906)
E. tenuiscripta (Warren 1907)
E. leucoprora sp. n.
E. biviridata (Warren 1896)
E. delozona Prout 1926
E. chlorophora Swinhoe 1895
E. lissopis sp. n.
E. eupitheciata (Walker 1863)

Row C

Eupithecia cauditornata Prout 1931
E. partitecta Prout 1931
Micromia olivaceata (Warren 1899)
M. fulvipuncta Warren 1906
M. decens (Warren 1906)
M. expectans sp. n.
M. hypocalypsis sp. n.

Row D

Micromia stabilis (Warren 1906)
M. adminiculata (Warren 1907)
M. curvimacula (Warren 1906)
M. commixtilinea (Warren 1907)
M. fulgurans (Warren 1907)
M. e. euthynsis sp. n.
M. leucocarpa sp. n.
M. novenaria sp. n.

Row E

Micromia acroscotia sp. n.
M. recessilinea sp. n.
M. rotundata (Warren 1906)
M. caesiata (Warren 1906)
M. dympna sp. n.
M. dinosia (Prout 1926)
M. chlaenistes Prout 1932

Row F

Micromia scotochlaena Prout 1931
M. conquadrata sp. n.
M. vinosa (Warren 1907)
M. transsecta (Warren 1907)
M. latistriga (Warren 1906)
M. eusemozona (Prout 1916)
M. dystacta sp. n.
M. infantilis (Warren 1907)

Row G

Micromia ectocosma sp. n.
M. viridisecta (Warren 1906)
M. cavilinea (Warren 1906)
M. barbata (Warren 1906) as *barbara*
M. novella (Warren 1903)
M. subcomosa (Warren 1907)
M. albimixta (Warren 1906)
M. ni sp. n.

Row H

Micromia thaumasia sp. n.
M. parvipennata (Warren 1906) ♂
M. parvipennata (Warren) ♀
M. monochasma sp. n.
M. dilopha sp. n.
Pseudosauris miranda (Warren 1903)
P. postfulvata (Prout 1916)
Chloroclystis consueta bowringi subsp. n.

Row I

Chloroclystis leucopygata Warren 1896
C. horistes sp. n.
C. atroviridis (Warren 1893)
C. boarmica sp. n.
C. infrazebrina Hampson 1895
C. naga sp. n.
C. speciosa Swinhoe 1902
C. acygonia Swinhoe 1895

Row K

Chloroclystis s. sinuosa Swinhoe 1895
C. sinuosa reddita subsp. n.
C. immixtaria (Walker 1862)
C. ablechra Turner 1904
C. metallospora Turner 1904
C. planiscripta (Warren 1902)
C. griseorufa Hampson 1898
C. polygraphata Hampson 1912
C. actephilae sp. n.

Row L

Chloroclystis dentatissima Warren 1898
C. admixtaria (Walker 1862)
C. fragilis Warren 1899
C. eichhorni sp. n.
C. bosora (Druce 1888)
C. rubicunda Prout 1934
C. hypotmeta Prout 1934
C. rotundaria Swinhoe 1902
C. biangulata Warren 1907

PLATE 40

Row A

Chloroclystis cuneilinea Warren 1906
C. distigma sp. n.
C. continuata Warren 1907
C. rhodopis sp. n.
C. emarginaria (Hampson 1893)
C. sordida (Warren 1903)
C. taraxichroma sp. n.
C. breyniae sp. n.
C. fluctuosa Prout 1934

Row B

Chloroclystis mempta Prout 1928 as *menysta*
C. spissidentata (Warren 1893)
C. infusata albitornalis subsp. n.
C. latifascia (Walker 1866)
C. woodjonesi sp. n.
C. lepta (Meyrick 1886)
C. torninubis Prout 1929
C. i. invisibilis Warren 1907
C. invisibilis invita subsp. n.

Row C

Chloroclystis filata (Guenée 1858)
C. clarkei Howes 1917
C. melanocentra Meyrick 1934
C. nereis (Meyrick 1887) as *nercis*
C. sphragitis (Meyrick 1887)
C. humilis Philpott 1917
C. lichenodes (Purdie 1887)

Row D

Chloroclystis m. magnimaculata Philpott 1915
C. magnimaculata irabunda subsp. n.
C. halianthes Meyrick 1907
C. acompsa Prout 1927
C. rubella Philpott 1915
C. heighwayi Philpott 1927
C. erratica Philpott 1916

Row E

Chloroclystis dryas (Meyrick 1891)
C. furva Philpott 1917
C. lunata Philpott 1912
C. charybdis (Butler 1879)
C. antarctica Hudson 1898
C. antarctica Hudson ab. *hudsoni* ab. n
C. lacustris Meyrick 1913

Row F

Chloroclystis paralodes Meyrick 1913
C. urticae Hudson 1939
C. zatricha Meyrick 1913
C. punicea Philpott 1923
C. aristias Meyrick 1897
C. cotinaea Meyrick 1913
C. semochlora Meyrick 1919

Row G

Chloroclystis muscosata (Walker 1862)
C. tornospila Meyrick 1931
C. melochlora Meyrick 1911
C. plinthina (Meyrick 1887)
C. sandycias Meyrick 1905
C. rivalis Philpott 1916
C. rufipellis Meyrick 1927
C. semialbata (Walker 1863)

Row H

Chloroclystis semialbata (Walker) ab. *indicataria* (Walker 1863)
C. inductata (Walker 1862)
C. suffusa Hudson 1928
C. coloptila Prout 1929
C. lanaris (Warren 1896)
C. recensitaria (Walker 1862)
C. celaenacris Prout 1932
C. subusta (Warren 1898)

Row I

Chloroclystis rectaria Hampson 1903
C. xenisma sp. n.
C. pugnax sp. n.
C. festivata (Warren 1903)
C. tortuosa West 1929
C. apotoma sp. n.
C. omocydia sp. n.
C. rufofasciata (Rothschild 1913)
C. autopepla sp. n.

Row K

Chloroclystis encteta Prout 1934
C. alpinista eupora subsp. n.
C. acervicosta sp. n.
C. catabares sp. n.
C. m. modesta (Warren 1893)
C. curviscapulis sp. n. ♂
C. curviscapulis sp. n. ♀
C. orphnobathra sp. n.

Row L

Chloroclystis plicata Hampson 1912
C. turgidata (Walker 1866)
C. oedalea sp. n.
C. subcostalis (Hampson 1893)
C. melampepla sp. n.
C. phoenicophaes sp. n.
C. cuneativenis sp. n.
C. pygmaeica sp. n.
C. atypha sp. n.

PLATE 41

Row A

Chloroclystis dilatata pelopsaria (Walker 1866) ♂
C. dilatata pelopsaria (Walker) ♀
C. dilatata hydrographica subsp. n.
C. destructata (Walker 1869)
C. insigillata (Walker 1862)
C. approximata (Walker 1869)
C. t. testulata (Guenée 1858)
C. testulata denotata (Walker 1862)
Desmoclystia dilataria (Warren 1906)

Row B

Chloroclystis cristigera (Warren 1906)
C. primivernalis Warren 1907 as *vernalis*
C. pallidivirens Warren 1903
C. rufibasalis(Warren 1906) as *rufibasis*
C. laticostata (Walker 1862)
C. luciana sp. n.
C. conversa (Warren 1897)
C. olivata (Warren 1901)

Row C

Chloroclystis nudifunda sp. n.
C. inaequata (Warren 1896)
C. rubroviridis (Warren 1896)
C. mira West 1929
C. obturgescens Prout 1926
C. palmaria Prout 1928 as *velutina*
C. velutina (Warren 1897) as *palmaria*

Row D

Chloroclystis analyta Prout 1928
C. permixta sp. n. ♂
C. permixta sp. n. ♀
C. papillosa (Warren 1896)
C. rubrinotata (Warren 1893)
C. f. filicata (Swinhoe 1892)
C. malachitis (Warren 1903)
C. dentifera (Warren 1906)

Row E

Chloroclystis chlorophilata (Walker 1863)
C. thaumasta Prout 1935
C. patinata (Warren 1897)
C. dissographa sp. n.
C. xanthocomes (Prout 1926) as *xanthocomis*
C. eugerys Prout 1929
C. seminotata Warren 1898
C. s. semiscripta Warren 1906

Row F

Chloroclystis c. craspedozona sp. n.
C. trichophora Hampson 1895
C. eurymesa (Prout 1932)
C. telygeta Prout 1932
C. rufitincta (Warren 1898)
C. decolorata (Warren 1900)
C. p. palpata (Walker 1862)
C. r. regularis (Warren 1895)

Row G

Chloroclystis palpata diechusa subsp. n.
C. palpata javana subsp. n.
C. oribates (Prout 1925)
C. ruptiscripta (Warren 1904)
C. coelica Prout 1932
C. variospila (Warren 1895)
C. r. regularis (Warren) ab. *tenuabilis* ab. n.

Row H

Chloroclystis regularis viridimargo subsp. n.
C. diaboeta sp. n.
C. eurystalides Prout 1932
C. diaschista sp. n.
C. viridata phaeina subsp. n.
C. viridescens (Warren 1895)
C. craspedozona heanis subsp. n.

Row I

Chloroclystis automola Prout 1929
C. s. subpalpata sp. n.
C. subpalpata fractiscripta subsp. n.
C. hypodela Prout 1926
C. isophrica Prout 1926
C. rubrifusa (Warren 1895)
C. chlorocampsis (Prout 1926)
C. ambundata Prout 1929 as *acabundata*

Row K

Eupithecia dolia West 1929
Chloroclystis bilineolata (Walker 1862)
C. malachita Meyrick 1913
Eupithecia interrubrescens (Hampson 1902)
Dysstroma filigrammaria Heydemann 1938
D. brunneoviridata Heydemann 1938

PLATE 50

Row A

Milionia dohertyi Rothschild 1897 ♀ as *doherty*
M. dohertyi Rothschild ♂ as *doherty*
M. mediofasciata Rothschild 1896 ♀

Row B

Milionia mediofasciata Rothschild ♂
M. grandis Druce 1883 ♀
M. grandis Druce ♂

Row C

Milionia celebensis Jordan & Rothschild 1895 as *colikensis*
M. pericallis Rothschild & Jordan 1905
Lobocraspeda coeruleostriga Warren 1897 as *aroa*

Row D

Milionia diva Rothschild 1904
M. callima Rothschild & Jordan 1905
M. ventralis Rothschild 1904
M. clarissima lysistrata Kirsch 1877

Row E

Milionia c. clarissima (Walker 1864)
M. basalis pyrozonis Butler 1882
M. rawakensis (Quoy & Gaimard) ab. *flammula Voll* (1863)

Row F

Milionia drucei Butler ab. *minahassae* Strand 1911
M. burgersi Gaede 1922
M. paradisea Jordan 1903

PART II

[Before his death in 1943, Mr. L. B. Prout completed a further manuscript which included the descriptions of many new species and subspecies of Geometridae in the British Museum (Natural History) : this manuscript would have been published in volume **12** of Seitz, *Macrolepidoptera of the World*, following in sequence those species described in the first part of this paper. The descriptions of the new species have been extracted from his original manuscript and are published in the following pages, together with six plates of figures. The figures are of varying magnification, and the actual wing length of the specimen photographed, measured from base to apex, is given in the legend accompanying the plates.—D. S. Fletcher, Dept. of Entomology, British Museum (Natural History).]

Ziridava xylinaria khasiensis subsp. n. (Fig. 2)

♂♀ 27-30 mm. Face pale or weakly suffused with red, generally with three distinct dark spots, two above and one on the cone. Fore wing with a densely fuscous area between cell spot and postmedial fascia, bounded anteriorly by subcosta and posteriorly by cubitus, and extending to the subterminal fascia between subcosta and vein Sc_5 and between veins R_1 and R_3.

INDIA : Darjeeling, Gopaldhara, 3,440-5,800 ft. (*H. Stevens*), 1 ♂ ; Shillong, 1 ♂ ; Cherrapunji, 1 ♂ ; *ibid.*, xi.1893, 4 ♂ ; *ibid.*, i.1894, 1 ♂ ; Khasia Hills, 36 ♂, 5 ♀, including holotype and allotype.

Ziridava xylinaria kanshireiensis subsp. n. (Fig. 3)

Similar in size and pattern to *Z. x. khasiensis* ; ground colour and pre-postmedial and terminal shading on both wings darkened.

FORMOSA : Kanshirei, 1,000 ft., 16.vii.1908 (*A. E. Wileman*), holotype ♂ ; *ibid.*, 3.vi.1908, allotype ♀ ; *ibid.*, 9.iii.1908, 1 ♀ ; *ibid.*, 19.viii.1905, 1 ♂ ; Koannania, 21.iv.1906 (*A. E. Wileman*), 1 ♂.

Examples from Palali, Benguet, in the Philippine Is., look very like those from Formosa.

Ziridava xylinaria baliensis subsp. n. (Fig. 1)

♂♀ 28-31 mm. Not so closely like *Z. x subrubida* Prout as I had at first thought (1937, *Novit.zool.*, **40** : 183). On the whole larger still ; markings of upperside more blurred, the pale subapical patch rarely so extendedly clear ; underside in the males often less densely suffused with fuscous.

BALI : 2,500 ft. (*W. Doherty*), 1 ♀ ; Batoeriti, 3,500 ft., vi.1935 (*J. P. A. Kalis*), 4 ♂, 1 ♀, including holotype and allotype ; Git-Git, 5,000 ft., v.1936 (*J. P. A. Kalis*), 1 ♀ ; Mondoktoempang, 2,500 ft., xi.1934 (*J. P. A. Kalis*), 1 ♂, 1 ♀.

Ziridava xylinaria florensis subsp. n.

♀ 31-32 mm. Gives the impression of a good species. Large, the fore wing very ample, markings weak, the cell dot elongate ; a fairly regular series of spots is situate distad of the subterminal fascia.

S. FLORES : xi.1896, dry season (*Everett*), 2 ♀, including holotype.

Ziridava rufinigra cedreleti subsp. n.

Differs from the nominate subspecies and from *Z. rufinigra brevicellula* Prout (1916) in having darker, less fleshy-tinted wings and having the black pattern less strongly developed, especially along the costa of the fore wing and at the anal angle of the hind wing.

AUSTRALIA : Queensland, Cedar Bay, south of Cooktown (*Meek*), 5 ♂, 6 ♀, including holotype and allotype ; Geraldton (*Meek*), 1 ♂, 3 ♀ ; Dawson, 1 ♀.

Ziridava asterota sp. n. (Fig. 4)

♂ 30 mm. Ground colour of wings cartridge buff ; costa of fore wing mottled with black as figured ; both wings patterned with black spots posterior of vein R_3 and distad of the postmedial fascia ; fringes spotted with black at the vein ends ; terminal interneural spots black ; postmedial fasciae and termen light vinaceous fawn, the former spotted with black on the veins ; remainder of wings crossed by numerous fasciae of capucine orange. Distinguished from *Z. xylinaria* Walker by the bright colour and pattern.

NORTH BORNEO : Mt. Kina Balu, v-viii.1903 (*John Waterstradt*), holotype ♂.

Calluga grammophora sp. n. (Fig. 5)

♂♀ 18-20 mm. Rather larger than *C. semirasata* Warren (1903) and still more like *C. costalis* Moore (1887) in shape and structure but looking more heavily marked, chiefly the result of the stronger development of the subordinate fasciae ; easily distinguished by the acute central projection of the postmedial fascia on the hind wing. Tufts on the male fore tibia and base of antenna nearly as in *costalis* and *C. cissocosma* Turner (1904) ; fore wing with the costal projection in the male not quite so strong, the venation similarly contorted ; antemedial fascia band-like. Hind wing of the male with the costal vein anastomosing with the cell at a point only, then approximated and later connected by a bar ; second subcostal stalked.

CENTRAL DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° long., ii.1911 (*A. S. Meek*), holotype ♂ and allotype ♀ ; *ibid.*, i.1911, 1 ♀.

BRITISH NEW GUINEA : Biagi, Mambare R., 5,000 ft., ii.1906 (*A. S. Meek*), 2 ♀ ; *ibid.*, iv.1906, 1 ♀.

ab. **completa** ab. n.

Of the three specimens from Biagi, two belong to the form, recurrent in the group, in which the proximal part of the hind wing is predominently black.

Gymnoscelis polyclealis albicetrata subsp. n.

Differs extremely little in colour and pattern from the nominate subspecies, but is noteworthy in that the vestiges of the proximal spurs of the hind tibia are generally wanting. Abdomen with a conspicuous white spot on second tergite. Hind wing with the white postmedial spots generally large, especially the posterior one ; the whitish area distad of the postmedial fascia is commonly continued to very near the termen, foreshadowing *p. hyperocha.*

W. CELEBES : Paloe, G. Tompoe, 2,700 ft., ii.1937 (*J. P. A. Kalis*), 2 ♂ including holotype ; Paloe, Koelawi, 3,100 ft., iii.1937 (*J. P. A. Kalis*), 1 ♀ ; Paloe, Lindoe, 3,700 ft., iv.1937 (*J. P. A. Kalis*), 6 ♂, 7 ♀ ; Paloe, Loda, 4,000 ft., v.1937 (*J. P. A. Kalis*), 4 ♀ ; Paloe, Sidaonta, 4,500 ft., vi.1937 (*J. P. A. Kalis*), 1 ♀.

SW. CELEBES : Tjamba, near Maros, 1,500 ft., ii.1937 (*J. P. A. Kalis*), 2 ♀.

Gymnoscelis polyclealis hyperocha subsp. n.

Differs from the nominate subspecies in having the white spots on the hind wing notably enlarged, the hind marginal one extending, though more narrowly, to the tornus, only interrupted by two ill-defined, though rather broad, fasciae or spots of the ground colour.

AUSTRALIA : Queensland, Kuranda, 1907 (*Dodd*), 3 ♀, including holotype.

Gymnoscelis expedita sp. n. (Fig. 6)

♀ 18 mm. Similar in size to a small *G. polyclealis*, which it further recalls in the position of the postmedial fascia and the obsolescence of all markings distad of it. Additional points of similarity are the rather thick antenna and the pronounced gloss of the wings, which also resemble in tone the palest *polyclealis*. Very distinct in the strongly sinuate margin of the hind wing and the great reduction of the markings, which consist solely of costal spots and the incomplete postmedial fascia on the fore wing and on the hind wing of the sharply angled postmedial fascia. Palpus one and one-half times as long as the diameter of the eye, apparently slightly longer than in *polyclealis* and similarly black.

MALAYA : Selangor, Bukit Kutu, 3,500 ft., 14.iii.1931 (*H. M. Pendlebury*), holotype ♀.

Gymnoscelis ammocyma sp. n. (Fig. 7)

♀ 15 mm. Frons with small cone. Palpus almost twice as long as the diameter of the eye, the second segment heavily scaled. Head and body concolorous with wings, the demarcation between the sandy dorsum and the whitish remainder distinct on abdomen. Fore wing pale and weakly marked, with a lens shown to be whitish and sandy in alternating, markedly waved fasciae or shades, the postmedial and the proximal subterminal the most band-like, the former somewhat incurved between the radials ; a few scattered black scales on the median vein and its second branch ; cell spot minute ; terminal fascia slender and broken into dashes, blackest on anterior half of wing. Hind wing with termen faintly concave between the radials; pattern as on fore wing, the postmedial fascia with the sinus between the radials more pronounced. Underside paler, the principal marks developed, especially on the hind wing; terminal fascia stronger than on upperside.

ADEN: 8.xii.1921 (*H. L. Powell*), holotype ♀; Sheik Othman, 20.xi.1898 (*W. R. D. Grant*), 1 ♀.

Gymnoscelis poecilimon sp. n. (Fig. 8)

♂ 22 mm. Larger than the average *Gymnoscelis*, male abdomen and fore wing elongate. Frons and palpus predominantly black, palpus almost twice as long as the diameter of the eye. Antenna almost simple. Thorax, abdomen and wings green above, the crests marked with brown; a red, black-mixed spot on front of tegula. Fore wing almost without irroration, except on some of the veins; markings on anterior half bright red brown varied with white and black. Hind wing similar, but with the red brown weakened and restricted. Underside more drab with darker ante- and postmedial fasciae. Related to *G. festiva* Warren (1903), differing in the more elongate wing, brighter green coloration and pattern and in the less angled postmedial fascia on the hind wing.

NEW IRELAND: ix.1923-i.1924 (*A. F. Eichhorn*), 2 ♂, including holotype.

Gymnoscelis festiva buruensis subsp. n.

Differs from the nominate subspecies in having the suffusion of the median area somewhat more reddish (though not so bright as in *G. poecilimon*) the subordinate markings, especially on the hind wing, weaker and the postmedial fascia on the hind wing less angular.

BURU: Leksula-Fakal, 2,800-3,700 ft., 20.x.1921 (*L. J. Toxopeus*), holotype ♀.

Gymnoscelis festiva jubilata subsp. n.

Brighter green than in the nominate subspecies, the suffusions of the central and especially of the distal area weakened. The postmedial fascia on the hind wing is even more angulate than in the nominate subspecies.

SW. CELEBES: G. Lampobattang, Parang-bobo Goa, 5,000 ft., v.1938 (*J. P. A. Kalis*), holotype ♀.

Gymnoscelis holoprasia sp. n. (Fig. 9)

♂ 15-18 mm. Palpus one and one-quarter times as long as the diameter of the eye. Head, body and wings predominantly light grape green, very sparsely irrorate with black; underside greyer. Abdomen at base with an indistinctly dark saddle. Fore wing with a reddish fuscous middle area, which is proximally ill-defined and irrorate with black; medial fascia, distad of the somewhat darker cell spot, whitish and twice excurved; distal margin of middle area edged with a white, denticulate fascia; subterminal markings very weak. Hind wing and underside weakly marked. Differs from the similarly coloured *G. callichlora* Turner (1907) in the shorter palpus, smaller size and less angulate postmedial fasciae on both fore and hind wings.

W. BALI: Prapetagoeng, 1,500 ft., v.1935 (*J. P. A. Kalis*), holotype ♂.

CEYLON: Colombo, x.1907 (*Mackwood*), 1 ♂.

Gymnoscelis protracta sp. n. (Fig. 10)

♂ 19.5 mm. Not quite so large as *G. merochyta* Prout (1932) ; in wing-shape and coloration of the hind wing very suggestive of *G. deleta* Hampson (1891), which may perhaps prove to be its nearest relative. Abdomen cartridge buff with dark transverse shading near base and just before the white anal extremity. Fore wing fuscous with a very characteristic longitudinal white band posterior of the cell, curving costad distally to end abruptly at the slender and sharply marked postmedial fascia, which is very strongly excurved ; white subterminal fascia ending at a conspicuous white, mid-terminal spot. Hind wing fuscous with white basal and postmedial fasciae marked broadly at the anal margin ; subterminal fascia slender and white, enlarged to a spot at mid-termen. Fore wing beneath more drab and glossy, the postmedial fascia indicated rather broadly ; the distal area with two broad, white fasciae, one bordering the postmedial fascia, the other close to the termen. Underside of hind wing similar to that of fore wing, but whiter in proximal half of wing.

MALAYA : Perak, Larut Hills, 3,700 ft., at light 14.ii.1932 (*H. M. Pendlebury*), holotype ♂.

Gymnoscelis pyrissous sp. n. (Fig. 11)

♂♀ 17-20 mm. Larger than *G. imparatalis* Walker (1865) but with similarly extreme elongation of the male abdomen and the fore wing. Tuft at base of fore coxa much less blackened. The fore wing may be regarded as intermediate between those of *G. biangulata* Swinhoe (1902) or *G. oblenita* sp. n. (Fig. 19) and *imparatalis*, in that the postmedial fascia is twice outwardly angled, more acutely than in *oblenita* but less extremely than in *biangulata*. Underside, also as in *imparatalis*, suffused and very weakly marked. Apparently fairly constant, except for the sexual dimorphism, which is similar to that of *imparatalis*.

TAMBORA : low country, iv-v.1896 (*W. Doherty*), 2 ♂, 1 ♀, including holotype and allotype ; *ibid.*, 2,500-4,000 ft., 1 ♂ ; *ibid.*, 2,500-4,000 ft., vi.1896, 2 ♂.

Gymnoscelis imparatalis opta subsp. n.

Differs from the nominate subspecies in having the ground colour of the wings warm cinnamon buff, the middle area almost immaculate, the other areas with heavy markings ; underside also less dark with the postmedial fasciae on both wings and the subterminal fascia on the hind wing usually distinct.

VULCAN ISLAND : xi.1913-i.1914 (*Meek*), 5 ♂, 13 ♀, including holotype and allotype.
DAMPIER ISLAND : ii-iii.1914 (*Meek*), 4 ♀.

Gymnoscelis anaxia sp. n. (Fig. 12)

♂ 19 mm.; ♀ 17 mm. By the shape of the postmedial fascia on the fore wing, this would seem to be closely related to *G. tristrigosa* Butler (1880), though the abdomen is not so slender. The longitudinally oblique streak of that species is apparently lost and the fascia of the hind wing is less acutely angled, especially on the upperside ; in both these respects it approximates more closely to *G. delocyma* Turner (1904). Postmedial fascia of fore wing broad in its anterior half.

TOEKAN BESSI ISLANDS : Tomia, xii.1901 (*H. Kuhn*), 2 ♂, 1 ♀, including holotype and allotype.

Gymnoscelis tristrigosa nasuta subsp. n.

Confined, so far as is known, to the Palni Hills. Has the wings more attenuate than in the nominate subspecies ; the postmedial fascia of the fore wing is less straight and less perpendicular in its anterior half and the irregularities of the postmedial fascia of the hind wing are somewhat exaggerated.

S. INDIA : Palni Hills, 1 ♂ ; *ibid.*, (*Campbell*), 2 ♂, 1 ♀, including holotype and allotype.

Gymnoscelis tristrigosa tongaica subsp. n.

♂ 18 mm. A small male of bright brown colour, inclining to cinnamon ; middle area almost immaculate. Evidently represents a local race, analagous to *G. imparatalis opta.*

TONGA ISLANDS : Haapai Islands, i.1911, holotype ♂.

Gymnoscelis argyropasta sp. n. (Fig. 13)

♂♀ 20-21 mm. Palpus one and one-half times as long as the diameter of the eye ; first segment fuscous beneath ; second segment beneath with a small fuscous tuft at end ; third segment blunt, small but distinct. Antennal ciliation vestigial. Fore coxa with a tuft of black scales at base, as in the *imparatalis* group. Male abdomen elongate but robust. Fore wing light brown with a faint tinge of olive ; fuscous irroration generally weak, though rather variable in amount, most noticeable in the proximal area ; some iridescent silvery-white irroration ; cell spot small, rarely conspicuous ; sub-basal fascia black at costa ; antemedial fascia compound, generally connected by dark shading ; postmedial fascia strongly excurved anteriorly and edged distally by a crenulate white line ; subterminal fascia dentate, made conspicuous in places by the accompanying dark shades ; terminal fascia interrupted at the veins. Hind wing with termen rather strongly rounded ; an immaculate white streak along fold ; postmedial fascia strongly outbent with black markings on the veins ; otherwise patterned as on fore wing. Underside more glossy, confusedly marked.

ST. MATTHIAS ISLAND : vi.1923 (*A. F. Eichhorn*), 1 ♂, 2 ♀, including holotype and allotype.

SQUALLY ISLAND : viii.1923 (*A. F. Eichhorn*), 1 ♂.
WOODLARK ISLAND : iii-iv.1897 (*A. S. Meek*), 3 ♀.
ST. AIGNAN ISLAND : x-xi.1897 (*A. S. Meek*), 1 ♂, 1 ♀.
ROSSEL ISLAND : iii.1898 (*A. S. Meek*), 1 ♂.
WITU ISLAND : vi.1925 (*A. F. Eichhorn*), 1 ♀.

Gymnoscelis lavella sp. n. (Fig. 14)

♀ 17.5 mm. Previously confused with *G. ochriplaga* Warren (1905); the palpus is shorter, scarcely if at all longer than that of female *G. imparatalis*; abdomen not bicolorous. Fore wing with first subcostal vein running into costal (in *ochriplaga* anastomozing); colour contrasts sharper than in that species; distal area, except tornad, weakly marked. Hind wing with the dark parts red brown instead of black, the pale area quite differently shaped and not ochreous, except for a slight ochreous brown tinge distally, and continuing fairly broad to costa.

SOLOMON ISLANDS: Vella Lavella, iii.1908 (*A. S. Meek*), 1 ♀.

Gymnoscelis distatica sp. n. (Fig. 15)

♂ 18.5 mm.; ♀ 21-22 mm. Male very similar in shape and structure to the male of *G. imparatalis* Walker (1865), but with just the same coloration and markings as the female, which is rather large and ample-winged and more likely to be confused with *G. deleta* Hampson (1891) than with *imparatalis*. Abdomen with two or three broad, dark, transverse bands dorsally. Fore wing with the cell spot in the female rather large, but fused with an outward angle in the antemedial fascia; postmedial fascia with the angles before the first and behind the third radial about equal and moderate, the white fascia outside it single, sharply defined distally by a further dark fascia; distad of the postmedial area, the wing is pale and buff-tinged at the costa and again in cellule three; distal area with broad, longitudinal, dark suffusions, one at the radials, the other in the tornal region; subterminal fascia slender and dentate; fringes rather dark with conspicuous, pale dots at the vein ends. Hind wing rounded; proximal part dark; postmedial fascia denticulate with a small inward curve posterior of middle; a white band distad of the postmedial broadens posteriorly; subterminal fascia strongly dentate, expanding in posterior half into a white terminal band; the area between these two white bands is light buffy brown so that the whole region forms a large pale area, recalling *Chloroclystis infusata albitornalis* Prout. Underside quite weakly marked; both wings dusky to beyond middle; the pale parts of the distal area of the upperside weakly reproduced.

INDIA: Khasia Hills, 1 ♂, 5 ♀, including holotype and allotype; Cherrapunji, 1 ♀.

Gymnoscelis derogata griseifusa subsp. n.

♀ 17 mm. Smaller than average *G. derogata* Walker (1866). Materially darker, more approaching in tone the Australian *G. subrufata* Warren (1898), but retaining on the upperside more of the reddish admixture and having nearly the same postmedial fascia as the nominate subspecies. The reddish underside has on both wings a weakened reproduction of the dark proximal markings, the antemedial fascia of the fore wing and the sub-basal of the hind wing, which are very strongly marked on the upperside.

W. CELEBES: Paloe, Gunong Tompoe, 2,700 ft., i.1937 (*J. P. A. Kalis*), holotype ♀.

Gymnoscelis derogata abrogata subsp. n.

Similar in size to the preceding. Fore wing coloured nearly as in the nominate subspecies; antemedial fascia dark, smooth-edged and sharply defined distally, ill-defined proximally and giving place to a pale olive greyish sub-basal area; middle area ill-defined distally; postmedial fascia very slender and dark, almost obsolete in its posterior half. Hind wing a little more suffused with greyish; the dark sub-basal patch is reduced to some less dark remnants.

BRITISH NEW GUINEA: Hydrographer Mts., 2,500 ft., ii.1918 (*Eichhorn Bros.*), holotype ♀.

Gymnoscelis phoenicopus sp. n. (Fig. 16)

♀ 22 mm. Closely related to *G. derogata* Walker (1866) but larger and with the palpus considerably longer, almost two and one-half times as long as the diameter of the eye. Fore coxa with a similar black patch at base. Fore wing reddish, but rather less strongly so than *G. subrufata* Warren (1898), especially on the underside; first subcostal vein anastomosing slightly with costal; proximal dark band wanting, but perhaps variable as in the allies; antemedial fascia strongly dentate; postmedial fascia projecting less than in *subrufata*. Underside with the postmedial fascia less obsolescent than in *derogata*, but not sharply defined.

CENTRAL CERAM: Manusela, 6,000 ft., x-xii.1919 (*C. F. & J. Pratt*), holotype ♀.

Gymnoscelis erymna nephelota subsp. n. (Fig. 17)

Differs from the nominate subspecies in having the medial and tornal areas of the fore wing suffused with dark or purple grey.

FIJI: Lautoka, 29.x.1930 (*H. Phillips*), 2 ♀ including holotype; Vunidawa, 4.ii.1932 (*H. Phillips*), 1 ♀; *ibid.*, 2.vii.1932, 1 ♀; *ibid.*, 26.vii.1932; *ibid.*, 23.ix.1932, 1 ♀.

Gymnoscelis mesophoena hagia subsp. n.

Very like some small and sharply marked *G. m. mesophoena* Turner (1907), especially on the upperside; general tone grey and brown rather than green and purplish; the irregularities of the postmedial fascia pronounced. Underside much browner, becoming whitish near termen, particularly in the apical part of the fore wing; postmedial fascia of fore wing strongly curved anteriorly so as to reach costa more obliquely than in the nominate subspecies.

ST. MATTHIAS ISLAND: vi-vii.1923 (*A. F. Eichhorn*), holotype ♂.

Gymnoscelis mesophoena taprobanica subsp. n. (Fig. 18)

Rather paler than the nominate subspecies, but differing chiefly in the deeper indentation of the postmedial fascia between the radials on the fore wing and often also on the hind wing.

CEYLON: 6 ♂, 15 ♀; Puttalam, holotype ♂; Kaslandi, iv.1902 (*Mackwood*), 1 ♀;

acq. *Doncaster*, 1892, 1 ♂, 2 ♀; Waftegama, vi.1905 (*Mackwood*), 1 ♀; Nawalapitiya, 1 ♀; Maskeliya, September, 1 ♀.

Gymnoscelis mesophoena celebensis subsp. n.

Very variable in size, the average probably the same as in the nominate subspecies. Almost invariably colder grey than any other subspecies; the postmedial fascia on the fore wing as in *m. taprobanica* or intermediate, that of the hind wing as irregular as in *m. hagia*. Underside drab grey without any vinaceous tinge.

W. CELEBES: Paloe, G. Rangkoenau, 900 ft., xi.1936 (*J. P. A. Kalis*), 1 ♀; Paloe, G. Tompoe, 2,700 ft., i-ii.1937 (*J. P. A. Kalis*), 8 ♂, 20 ♀, including holotype and allotype.

Gymnoscelis oblenita sp. n. (Fig. 19)

♂ 17 mm. Evidently very near *G. mesophoena* Turner (1907) with closely similar femoral tuft. Male palpus longer, rather more than one and one-half times as long as the diameter of the eye, with a more elongate third segment. Ciliation one-third as long as the diameter of the shaft, a little shorter than in *mesophoena*. Wings and abdomen slightly less elongate. Colour more brownish, the proximal part of the fore wing somewhat diffuse, the subterminal shading weak and uniform. Hind wing with proximal markings faint; postmedial fascia not appreciably indented medially. Underside with only the postmedial fasciae clearly developed; subterminal shade discernible on fore wing.

MALAYA: Selangor, Bukit Kutu, 3,500 ft., at light 17.iii.1931 (*H. M. Pendlebury*), 2 ♂, including holotype.

Gymnoscelis conjurata sp. n. (Fig. 20)

♂♀ 19-21 mm. Fore femur of male clothed similarly to those of *G. mesophoena* Turner (1907) and *G. oblenita*. Both wings in the male with the termen gibbous, the fore wing in its anterior part, the hind wing more centrally; costa of fore wing with a fringe of projecting hair near base. Coloration nearly as in *G. ectochloros* Hampson (1891); postmedial fascia of fore wing with projections both in front of the first radial vein and between the third radial and the first medial; light green band between the postmedial fascia and the subterminal shade broad and clear.

CEYLON: Punduloya, vi-vii.1897 (*Green*), holotype ♂, 2 ♀; Maskeliya, 2 ♀, including allotype; Harutu, 1 ♂; ex *Green* coll., 1 ♀; Haputali, 1 ♂.

Gymnoscelis latipennis sp. n. (Fig. 21)

♂ 17-19 mm. Very near *G. albicaudata* Warren (1897), the fore wing still broader than in *G. ectochloros* Hampson (1891), the costal fringe longer proximally and continuing, though shortening, to beyond two-thirds; femoral fringe strong (mostly abraded in type.) Browner; the white mid-terminal spot distinct on both wings; the postmedial fasciae, both above and beneath, more outwardly dentate at the third radial vein.

MALAYA : Perak, Gunong Ijan, 2 ♂, including holotype ; Selangor, Bukit Kutu, 3,500 ft., at light 14.iv.1926 (*H. M. Pendlebury*), 2 ♂.
INDIA : Khasia Hills, xi.1894, 1 ♂.

Gymnoscelis latipennis nepotalis subsp. n.

♂ 22 mm. Considerably larger than the nominate subspecies, rather darker and more strongly marked, especially as regards the antemedial fascia of the hind wing above and beneath, the angle of which touches the black cell spot ; postmedial fascia of hind wing less angled.

E. JAVA : Tengger, Singolangoe, 5,000 ft., v.1934 (*J. P. A. Kalis*), holotype ♂.

Onagrodes victoria sp. n. (Fig. 25)

♂ 22-23 mm. Fore wing with posterior area rather ample ; inner margin with a tuft of black, posteriorly projecting scales just before tornus ; ground colour bister ; postmedial and subterminal fasciae warm buff and dentate, the former toothed distad between veins Sc_5 and R_1, incurved basad posterior of vein M_1, thence straight to inner margin ; dark cell mark not very intense. Hind wing without buff scale-patch ; a little paler than fore wing, almost unicolorous ; anal margin folded, enclosing a tuft of black scales ; indications of a dark terminal fascia and, at least posteriorly, its accompanying warm buff vein-dashes. Underside of both wings snuff brown ; ante- and postmedial and terminal fasciae pale and broad.

BURMA : S. Tenasserim, Victoria, xii.1890 (*W. Doherty*), holotype ♂ ; Tenasserim Valley, East of Tovoy (*Doherty*), 1 ♂.

Onagrodes barbarula sp. n.

♂ 24 mm. Notwithstanding the vast geographical separation, this is evidently a close relative of *O. victoria*, perhaps eventually a subspecies. Except that the black scale-tuft on the inner margin of the fore wing appears considerably reduced, no other marked structural difference is apparent. Vertex and tegula clay-colour, thorax above dark brown. Fore wing slightly more expanded posteriorly than in *victoria*, in colour not quite so uniform, being slightly darker in the medial than the distal area, the pale dividing fascia conspicuous except posteriorly where, posterior of vein M_1 it bends sharply basad, reminiscent of the well-known *Alcis repandata* Linn. and its near relatives of the Palaeartic and Himalayan faunas. Underside moderately well marked, the fore wing from costa to median vein, the hind wing throughout ; on the fore wing a dark cell spot and strongly curved and band-like postmedial and subterminal fasciae on a snuff brown ground colour ; on the hind wing these bands are rather more proximally placed.

NEW IRELAND : xii.1923 (*A. F. Eichhorn*), holotype ♂.

Onagrodes oosyndica sp. n. (Figs. 22, 23)

♂ 23 mm.; ♀ 23-24 mm. This and the following species show the culmination of the male specializations of *Onagrodes*, the hind wing bearing both the buff spot and the black hind marginal pencil. In *oosyndica* the size (little over 1 mm.) and position of the former agree accurately with those of *O. recurva* Warren (1907), of which it might have been considered a subspecies but for the presence of the small pencil or fringe beyond the middle of the anal margin of the hind wing. Abdomen with middle segments dark dorsally. Fore wing drab densely irrorate with snuff brown to bister; cell spot more heavily marked in bister; a conspicuous spot of the pale ground colour midway along vein SM_1. Hind wing drab in proximal two-thirds with a patch of light buff specialized scaling medially; snuff brown in distal third. In the female the wings are dark olive buff; numerous transverse fasciae, conspicuous cell spot and terminal area, except on veins, drab to fuscous. Underside bister; inner margin of fore wing, broad antemedial, medial, postmedial and subterminal fasciae light buff.

MALAYA: Pahang, Cameron Highlands, 4,800 ft., at light 17-24.vi.1935 (*H. M. Pendlebury*) holotype ♂ and allotype ♀.

Two females from Paloe, W. Celebes probably belong to this species.

Onagrodes eucineta sp. n. (Fig. 26)

♂ 22.5-24 mm. Nearly related to *O. oosyndica*, but readily recognizable by the buff sex-patch on the underside of the fore wing, occupying the middle third of the wing between veins M_2 and SM_1. The black hair-tuft on the anal margin of the hind wing is more strongly developed. In colour paler and less uniform than *oosyndica*, the dark irroration being much reduced; inner margin with traces of broad, double ante- and postmedial fasciae. Snuff brown coloration on hind wing confined to distal fourth; patch of buff-coloured specialized scaling on proximal part paler and more elongate than in *oosyndica*.

MALAYA: Selangor, Bukit Kutu, 3,500 ft., at light 14-16.iii.1931 (*H. M. Pendlebury*), 2 ♂, including holotype.

Pseudomimetis vailima sp. n. (Fig. 27)

♀ 17.5 mm. Smaller than *P. semiviridis* Warren (1897) and more ochreous in coloration, especially on the hind wing. Fore wing with the outer pale band complete but very narrow, only whitish buff in its proximal half; band at end of cell ochreous and poorly defined. Hind wing with all markings, except cell spot, weak; no trace of the dark tornal patch that is conspicuous in *P. picta* Warren (1901).

SAMOAN ISLANDS: Upolu, Vailima, 1.ii.1924 (*P. A. Buxton & G. H. Hopkins*), holotype ♀.

Hybridoneura metachlora (Hampson) ab. ***semivinosa*** ab. n.

Postmedial and subterminal markings of fore wing very weak, leaving almost entire outer area uniformly vinaceous.

CEYLON: Haputale, holotype ♀; Galagedera, 1 ♀.

NORTH BORNEO: Mt. Kina Balu, v-viii.1903 (*John Waterstradt*), 1 ♀.

CELEBES: Paloe, G. Tompoe, 2,700 ft., i.1937 (*J. P. A. Kalis*), 1 ♀; Paloe, Lindoe, 3,700 ft., iv.1937 (*J. P. A. Kalis*), 1 ♀.

Hybridoneura metachlora lativitra subsp. n. (Fig. 29)

♂ 18·5 mm. Differs from *H. m. metachlora* Hampson (1907) in having the membranous patch on the fore wing shorter and broader. In the nominate subspecies the ratio of breadth to length is 4·5 : 1·8 ; in *lativitra* it is 4·0 : 2·4.

MALAYA : Selangor, Bukit Kutu, 3,500 ft., at light 16.iii.1931 (*H. M. Pendlebury*), holotype ♂.

Hybridoneura truncata sp. n. (Fig. 28)

♂ 20 mm. Membranous patch on fore wing shorter than in the preceding species ; ratio of breadth to length 3·3 : 2·0 ; black cell streak more strongly concave ; apical area suffused with russet ; a conspicuous fuscous costal spot is situate proximad of the subterminal fascia. Hind wing with a fringe of long hair from costal margin, not spreading forward so much as that of *Mariaba convoluta* Walker (1866), being more nearly parallel with the costal margin itself.

BRITISH NEW GUINEA : Hydrographer Mountains, 2,500 ft., i-ii.1918 (*Eichhorn Bros.*), 2 ♂, including holotype.

Antimimistis attenuata melamphaes subsp. n.

♂♀ 18-22 mm. Upperside more sombre than in *A. a. attenuata* Moore (1887), the subordinate fasciae weakened, especially in the median area of both wings ; mid-subterminal whitish spots nearly always very small, sometimes wanting. Underside in the male darker, sometimes almost unicolorous, invariably with the pale fasciae greatly weakened.

W. CELEBES : Paloe, G. Rangkoenau, 900 ft., xi.1936 (*J. P. A. Kalis*), 1 ♀ ; *ibid.*, 1,800 ft., xii.1936, 2 ♂ ; Paloe, G. Tompoe, 2,700 ft., i-ii.1937 (*J. P. A. Kalis*), 5 ♂, 4 ♀, including holotype and allotype ; Paloe, Koelawi, 3,100 ft., iii.1937 (*J. P. A. Kalis*), 1 ♂, 1 ♀ ; Paloe, Lindoe, 3,700 ft. (*J. P. A. Kalis*), 3 ♂, 2 ♀ ; Paloe, Loda, 4,000 ft., v.1937 (*J. P. A. Kalis*), 2 ♂, 3 ♀ ; Paloe, Sidaonta, 4,500 ft., vi.1937 (*J. P. A. Kalis*), 3 ♂, 1 ♀.

SW. CELEBES : Pangean, near Maros, 2,000 ft., iii.1938 (*J. P. A. Kalis*), 2 ♀.

Antimimistis cuprina sp. n. (Fig. 30)

♂♀ 20-25 mm. Hind tibia of both sexes with one pair of spurs. Larger than *attenuata* Moore. Head, abdomen and the lighter parts of the wings, particularly the clean band distad of the postmedial fascia, with a much more coppery tone, giving the species a most distinctive appearance. Breast and spot on tegula reddish. Fore wing with the dark median area almost unicolorous, except for three very slender white fasciae, which generally stand out sharply, the medial fascia bent more acutely on the first radial vein than in most *Antimimistis*. Abdomen with the dark transverse markings reduced to intersegmental lines, a white line dividing it from the thorax. Underside moderately well marked.

CEYLON : Haldamulla (*Mackwood*), 1 ♂ ; Kandy (*Mackwood*), 3 ♂, 1 ♀, including holotype and allotype.

Brabira operosa sp. n. (Fig. 31)

♂ 25 mm.; ♀ 27·5 mm. Confused by Hampson in the British Museum with *B. costimacula* Wileman (1915) and with some other undescribed species similar to *B. atkinsonii* Moore (1888). Tone slightly more fleshly than in most of the group, including *costimacula,* in which there is more of an olive tinge. Fore wing with cell spot narrowed ; two approximated and parallel antemedial fasciae ; postmedial fascia developed into a shadowy band ; subterminal fascia accompanied anteriorly by a grey shade. Hind wing with second subcostal vein coincident with first radial, not stalked ; the projection of the termen about the first median in both sexes much less developed than in *costimacula.*

SIKKIM : 7,000 ft., vii.1896 (*Pilcher*), holotype ♂ ; *ibid.*, vii.1909 (*F. Moller*), allotype ♀.

Microloba bella taracta subsp. n.

Differs from the nominate subspecies in the hind wing, in which the cell is a little shorter and the cell spot almost obsolete ; on the underside the band distad of the cell spot is concise and a little bent.

SIKKIM : (*Knyvett*), holotype ♂ ; *ibid.*, 25.v.1889, 1 ♂.

Heterophleps parapasta sp. n. (Fig. 33)

♂ 33 mm. Closely similar to *H. acineta* Prout (1926) and found on the same mountain at a higher elevation. Antenna with the fascicles rather less developed, as also the short teeth from which they arise. Abdomen more slender. Fore wing above scarcely distinguishable, beneath with a broader orange costal edge. Hind wing larger, noticeably more angled at the third radial vein, its fascia rather more distally placed though on the upperside very indistinct.

BURMA : Mt. Victoria, Pakokku, Chin Hills, 2,600 m., 2-31.v.1938 (*G. Heinrich*), holotype ♂.

Heterophleps heinrichi sp. n. (Fig. 32)

♂ 27-28 mm. May be placed next to *H. variegata* Wileman (1911) though the antennal ciliation is less long, the posterior area of the hind wing less extremely reduced, and the first median vein extends to the " false " tornus instead of extending to the abdominal margin. The warm colour of the fore wing begins to approach that of *H. sinearia* Wehrli (1931) or rather—in having the distal area somewhat suffused with dark grey—*H. sinuosaria* Leech (1897) ; antemedial fascia very slight ; costal spots relatively large and black, the distal one irregularly quadrate. Hind wing with discocellulars angled inward at radial fold, thence very obliquely outward ; second radial vein arising very near third ; first median vein also approximated.

BURMA : Pakokku, Chin Hills, 2,200 m., 15-30.vi.1938 (*G. Heinrich*), 4 ♂, including holotype.

Ellipostoma nom. n.

The generic name *Myostoma* Warren (1893) is preoccupied by *Myostoma* Robineau-Desvoidy (1830). To replace it, the name *Ellipostoma* is proposed.

Cryptoloba mesta sp. n. (Fig. 35)

♂♀ 29-35 mm. Areole simple ; discocellulars in female not biangulate. Similar in structure to *C. aerata* Moore (1867) but with rather shorter antennal pectinations. In the restriction of the yellow markings, similar to *C. minor* Warren (1893). Differs from both in the fore wing in the centrally excurved medial fascia and in the increased black shading accompanying the transverse fasciae and the subterminal spot about the first radial vein ; differs also in the straighter postmedial fasciae on both the upper and undersides of both wings and in the increased black marking on the underside. Cell spot on fore wing small ; on hind wing variable.

INDIA : Sikkim, 7,000 ft., 1889 (*O. Möller*), 1 ♀ ; Sikkim, 1884 (*R. P. Bretaudeau*), 1 ♂ ; Darjeeling, vii.1886 (*H. J. Elwes*), 1 ♀ ; Darjeeling, 3,440-5,800 ft. (*H. Stevens*), 2 ♂, 1 ♀ ; Shillong, ii.1884, 2 ♂, including holotype ; Cherrapunji, 3 ♂ (viii.1893 ; xi.1893 ; vii.1894) ; Khasia Hills (*Nissary*), 22 ♂, 5 ♀.

BHUTAN : ix.1888 (*O. Möller*), 2 ♂ ; 2,500 ft., 5.viii.1895 (*Dudgeon*), 1 ♀.

BURMA : Mishmi Hills, Dingliang, 2,450 ft., 14.iii.1935 (*M. Steele*), 1 ♂.

Cryptoloba peperitis sp. n. (Fig. 36)

♂ 35 mm. Areole, female discocellulars and pectinations of antennae as in the preceding species. Fore wing as far as the subterminal fascia with nearly the same pattern as *C. aerata* Moore (1867), but paler and with the yellow admixture less extended ; subterminal fascia broken into lunules, rather as in the preceding species, but with a more continuous and white, not yellow, mark from the second radial vein to the tornus. Differs from *C. minor* Warren (1893), *aerata* and *mesta* in the pale hind wing, which is cartridge buff irrorate with fuscous.

INDIA : Sikkim (*O. Möller*), holotype ♂.

A worn female from Buxa, Bhutan, seems to belong with this species.

Cryptoloba metorchatica sp. n. (Fig. 34)

♀ 35 mm. Probably quite nearly related to *C. peperitis*, but in pattern more like a *Carige*. Fore wing slightly broader than in *peperitis*, costa a little more curved, termen appreciably concave anteriorly with a small, rounded tooth at the third radial vein ; much yellower in colour, the blue-whitish patches being much reduced and the dark irroration less coarse ; the paired fuscous black markings are stronger, contrasting sharply with the pale intervals ; terminal fascia fine, sinuous and yellow. Hind wing appreciably sinuate between the radials ; second subcostal vein short-stalked ; discocellulars not biangulate.

W. CHINA : Tien-Tsuen, 1901 (*Chasseurs indigènes du P. Déjean*), holotype ♀.

Chrioloba gen. n.

Structural characters nearly as in *Cryptoloba*, with which it has hitherto been united, notwithstanding the small size of the species and the quite different colour-scheme. Antenna with the segments longer, the pectinations consequently more widely spaced, more robust and suberect, usually numbering about 26. Frenulum wanting or quite vestigial. Areole large, proportionately broad, never double; first subcostal vein generally approaching costal, in two species anastomosing. The hind wing is subject to considerable variation in venation, though on the whole closely following that of *Cryptoloba*.

Type species: *Lygranoa cinerea* Butler (1880).

Chrioloba andrewesi sp. n. (Fig. 37)

♂ 23 mm. Pectinations as in *C. indicaria* Guérin (1843), extremely long and continuing for about 26 segments; in *C. bifasciata* Hampson (1891) usually about 20, sometimes rather more. In wing-shape and pattern very suggestive of a *bifasciata* with a well banded hind wing. Fore wing with very different venation; first subcostal vein well separated from costal, discocellulars not biangulate and second radial vein about central. Antemedial band more broadened at costa, weakening posteriorly; postmedial band also broadened at costa, though less markedly, and with only one outward tooth strong; dark markings on subterminal shade weak.

INDIA: Nilgiri Hills, Pykara, 6,500 ft. (*H. L. Andrewes*), holotype ♂.

Chrioloba ochraceistriga sp. n. (Fig. 40)

♂ 20 mm. Structure about as in *C. cinerea* Butler (1880). Fore wing with no black markings, except extremely short dashes at costal margin; transverse fasciae brighter than clay colour, almost ochraceous buff, slightly broadened and intensified costad. Hind wing slightly paler. Underside of fore wing without the dark grey suffusion in the cell which is usual in *cinerea*; the costal margin as far as the costal vein and the entire distal region at least as far as the first radial vein are suffused with clear cinnamon buff.

INDIA: Khasia Hills (*Native coll.*), holotype ♂.

Chrioloba ochraceistriga sectilinea subsp. n. (Fig. 41)

♂ 20·5-24 mm. The transverse fasciae are less bright, being divided longitudinally by fuscous; antemedial fascia usually straighter than in the nominate subspecies; apical fringe with a dark dash.

W. CHINA: Mou-Pin, 1897 (*ex. R. P. Déjean*), 2 ♂, including holotype; Siao-Lou, 1896 (*Chasseurs Thibetains*), 2 ♂; Tay-Tou-Ho, 1897 (*ex. R. P. Déjean*), 1 ♂.

Carige extremaria coniochyta subsp. n.

♂ 24 mm. Very similar to the smallest, greyest *C. e. extremaria* Leech (1897), the tooth of the third radial scarcely so long. The best distinctions are in the proximal subterminal dark markings, which on both wings are more extended proximally in cellules 6 and 5 ; the subterminal fascia itself, though very slender, is more continuous.

BURMA : Mt. Victoria, Pakokku, 2,200 m., 15-30.vi.1938 (*G. Heinrich*), holotype ♂.

Goniopteroloba biconcava sp. n. (Fig. 38)

♂ 25·5 mm. In general structure and in the coloration and markings of the fore wing very similar to *G. fuscata* Warren (1897), but much more pronounced in shape. Fore wing with termen appreciably less oblique ; both wings with the tooth at the third radial vein strengthened and the concavities deepened, on the fore wing anteriorly, on the hind wing posteriorly. Fore wing of not quite so warm a brown, the costal spots rather larger. Hind wing paler proximally ; the postmedial fascia failing anteriorly, thickened and blackened posteriorly. Underside with subtriangular blackish terminal maculation adjoining the concavity. Antennal pectinations perhaps not quite so long as in *G. fuscata*.

NORTH BORNEO : Mt. Kina Balu, v-viii.1903 (*John Waterstradt*), holotype ♂.

Goniopteroloba pallida pangeanensis subsp. n. (Fig. 39)

More ochreous than the high-altitude nominate subspecies ; the markings are less sharp and the black spot distad of the postmedial fascia on the fore wing is wanting or vestigial.

SW. CELEBES : Pangean, near Maros, 2,000 ft., iii.1938 (*J. P. A. Kalis*), 4 ♂, including holotype.

Leptostegna asiatica antelia subsp. n.

♂♀ 33-40 mm. Represents the prevailing form in W. China. On the whole larger than *L. a. asiatica* Warren (1893), fore wing less white-mixed, commonly with almost the uniformly green ground colour of *L. tenerata* Christoph (1881), but conserving the rather broad and conspicuously dentate transverse fasciae of the nominate subspecies ; the ground colour is not deepened in the median area where it touches the transverse fasciae.

CHINA : Siao-Lou, 4 ♂, 3 ♀ ; Tay-Tou-Ho, 1 ♂ ; Tien-Tsuen, 1 ♂ ; Ta-Tsien-Lou, 2 ♂ ; Chia-Kou-Ho, 1,700 ft., vii.1889 (*A. E. Pratt*), 1 ♀ ; Wa-Shan, 6,000 ft., vi.1889 (*A. E. Pratt*), 1 ♂, 4 ♀, including holotype and allotype ; Chang Yang, vi.1888 (*A. E. Pratt*), 1 ♂, 1 ♀.

Acasis viretata himalayica subsp. n.

Besides being on the whole smaller and duller, with somewhat less uniform hind wing, *himalayica* has the antemedial fascia of the fore wing more angular, in fact rectangular at the median vein and almost or quite equally so in the reverse direction behind the fold; there is often more dark suffusion or irroration in the proximal area and almost always considerable strengthening of the subterminal maculation between the radial veins and posteriorly. Hind wing brown grey, the postmedial fascia and the slender white fascia distad of it generally distinct.

INDIA: Dalhousie (*Harford Coll.*), 1 ♀; Dharmsala, 1 ♀; Sikkim (*Chasseurs indigenes R. P. Bretaudeau*), 1 ♂; Sikkim, 22.iii.1888 (*O. Moller*), 1 ♀; Darjeeling, 1 ♂; Assam, 7 ♂; Shillong, 1 ♂; Cherrapunji, 4 ♂; Khasia Hills, 25 ♂, including holotype; Naga Hills, 5,500-7,000 ft., ix-x.1889 (*W. Doherty*), 1 ♂.

BURMA: Mishmi Hills, Dingliang, 2,400 ft., 14.iii.1935 (*M. Steele*), 1 ♂; Hpimaw Fort, 8,000 ft., viii.1923 (*A. E. Swann*), 2 ♂; Htawgaw, 6,000 ft., iv-v.1923 (*A. E. Swann*), 2 ♂.

CHINA: Siao Lou, 1 ♂; Ta-Tsien-Lou, 2 ♂; Mt. Omei, 3,500 ft., 14.viii.1931 (*G. M. Franck*), 1 ♂.

FORMOSA: Rantaizan, 15.v.1909 (*A. E. Wileman*), 1 ♂.

Nothocasis octobris sp. n. (Fig. 42)

♂♀ 39 mm. Frons nearly smooth. Palpus slender and blackish, in the male extending little beyond the frons, in the female one and one-half times as long as the diameter of the eye. Antennae pubescent. Male hind leg with a hair pencil. Wings glossy and thinly scaled. Frenulum very short. Fore wing with second discocellular inbent, a more or less developed angle at base of second radial vein; cell spot large and black; median area composed of two bands, which consist respectively, in well marked specimens, of three and of four fasciae, the first postmedial angled near costa. Hind wing with second subcostal vein in male arising well separated; less unicolorous than *N. neurogrammata* Püngeler (1909), which probably stands between *octobris* and *polystictaria* Hampson (1903).

CHINA: Szechuan, Liang-fen-kang at 2,500 ft. to Shih-shah-shu at 7,400 ft., 4.x.1929 (*Kelley-Roosevelt Expedition*), holotype ♂; Shih-shah-shu, 7,400 ft., 7.x.1929 (*Kelley-Roosevelt Expedition*), 1 ♂, 1 ♀; Moupin, vi.1890 (*Kricheldorff coll.*), 1 ♂.

Trichopteryx polystictaria tsangpoensis subsp. n. (Fig. 43)

♂ 19·5 mm. The pattern on the fore wing is more fuscous and more clearly marked; the pale subterminal fascia is more sharply marked. The hind wing is whiter proximally.

SE. TIBET: Tsangpo Valley, Doshong La, 10,500 ft., 21.x.1924 (*F. Kingdon Ward*), holotype ♂.

Trichopteryx knyvetti sp. n. (Fig. 44)

♂ 37·5 mm. Bears somewhat the same relationship to *N. sikkima* Moore (1888) as *Trichopterigia micradelpha* sp. n. to *T. nigronotata* Warren (1893). Fore wing with black costal dots and some black on the sub-basal and double subterminal fasciae; the paired black spots between the radials large and proximally confluent;

medial and postmedial fasciae black brown, connected in middle and blackened at the hind margin with a white spot between them ; antemedial fascia punctiform from costa to base of second median vein. Hind wing with two transverse fasciae, the proximal one the more strongly marked.

INDIA : Sikkim (*Knyvett*), holotype ♂.

Trichopterigia rubripuncta miantosticta subsp. n. (Fig. 47)

♂ 30-36 mm.; ♀ 37·5 mm. Fore wing with ground colour rather purer white than in the nominate subspecies, though at least as strongly irrorate with light greyish olive ; the red maculation almost wanting in the proximal area and reduced in the median area ; the first fascia of the distal area placed a trifle further from the termen, admitting of a slight elongation of the red subterminal spots, which are moreover more extensively overlaid with dark olive grey shading distally.

WEST CHINA : Siao-Lou, 1900 (*Chasseurs indigènes*), 2 ♂, including holotype ; Ta-Tsien-Lou, 1893 (*Chasseurs indigènes*), allotype ♀.

Trichopterigia dejeani sp. n. (Fig. 45)

♂♀ 37-39·5 mm. Wings, particularly in the male, less broad than in *T. rubripuncta miantosticta*, to which it is nearly related ; palpus a little shorter, about one and one-half times as long as the diameter of the eye. Fore wing with the median area better defined than in *miantosticta*, the proximal two and the distal three fasciae strengthened at the costa, enclosing in the broadened anterior half of this area a central patch of the ground colour, whereon is situate the somewhat inconspicuous cell spot ; first line of postmedial fascia bent or angled near costa ; distal area rather more strongly marked than in *miantosticta*. Hind wing with a minute cell spot, a narrow, somewhat shadowy grey band very near termen and some faint proximal suffusion.

W. CHINA : Ta-Tsien-Lou, v-vi.1892 (*Chasseurs thibetains*), holotype ♂ ; *ibid.*, 1903 (*Chasseurs indigènes du P. Déjean*), allotype ♀ ; *ibid.*, 1893, 1 ♀ ; *ibid.*, été, 1894, 1 ♀ ; *ibid.*, été, 1896, 1 ♀.

Trichopterigia rufinotata illumina subsp. n. (Fig. 46)

A considerably darker form, differing especially in the hind wing, which is grey instead of white and has a conspicuously darkened border.

TIBET : Yatong (*A. E. Hobson*), holotype ♂.

Trichopterigia pilcheri sp. n. (Fig. 48)

♂ 37·5 mm.; ♀ 40·5 mm. Very nearly related to *T. ustimargo* Warren (1896), for which Warren mistook it. Much larger and appreciably different in shape ; fore wing with costa slightly more curved, termen not curving so strongly behind the third radial vein ; hind wing with termen more bluntly angled at the second subcostal vein. Markings slenderer ; the blackish hind marginal streak of the fore wing is interrupted by the double, pale fascia which bounds proximally the posteriorly narrowed median area. Hind wing with the postmedial fascia and distal greyish shading clearly though weakly defined.

INDIA : Darjeeling, 18.iii.1889 (*Pilcher*), holotype ♀; Sikkim, 7.iv.1889 (*J. G. Pilcher*), allotype ♂.

Trichopterigia rivularis acidnias subsp. n. (Fig. 49)

♂ 33·5-34·5 mm. Rather smaller than *T. r. rivularis* Warren (1893). Fore wing more red-mixed in the median area ; black markings at basal and median thirds of the inner margin intensified ; distal lines of the postmedial fascia generally very faint and incomplete ; subterminal red brown spots, especially those between the radials, clear, scarcely or not at all mixed with gray.

W. CHINA : Tsekou (*R. P. J. Dubernard*), 11 ♂, including holotype.

Trichopterigia adiopa sp. n. (Fig. 51)

♂ 34·5 mm.; ♀ 36 mm. Closely related to *T. rivularis* Warren (1893). Fore wing with the double fascia between the basal and the median areas much less angular, sometimes bandlike ; double subterminal fascia more sinuous and interrupted, in places thickened. Hind wing cleaner white, almost without apical suffusion.

INDIA : Darjeeling, 24.ii-9.iv.1889 (*Pilcher & Knyvett*), 2 ♂, 3 ♀, including holotype and allotype.

BHUTAN : Buxa, 1 ♀.

Trichopterigia hagna sp. n. (Fig. 50)

♂ 38 mm.; ♀ 40 mm. Resembles *T. adiopa*. Head white, irrorate with fuscous. Abdomen fuscous above with white spots ; white beneath. Fore wing white and glossy with very little dark irroration ; markings much as in *adiopa*, fuscous mixed with red, strongly in the female ; basal patch fragmentary, even the two broad fasciae which limit it incomplete ; median area narrow, its ante- and postmedial fasciae, formed of groups of lines, approximating or coalescing about the median vein and its branches, the postmedial straight as far as the second submedian vein, extremely oblique and black at hind margin ; subterminal spots at radials elongate, predominantly red. Hind wing clean white.

BURMA : Mishmi Hills, Minutang, 3,900 ft., 21.ii.1935 (*M. Steele*), holotype ♂ and allotype ♀.

Trichopterigia micradelpha sp. n. (Fig. 53)

♂♀ 28·5-30 mm. Fore wing : the white central band encloses the cell spot and is bounded both proximally and distally by black fasciae, the distal one complete, the proximal one more punctiform with an outward bend at the hind margin ; terminal paired dots accompanied proximally by dark marks at veins. Hind wing cartridge buff with a drab medial fascia parallel with the termen.

INDIA : Sikkim, 27.iii-6.iv.1889 (*J. G. Pilcher*), 4 ♂, 4 ♀, including holotype and allotype ; *ibid.*, 23.iii.1889 (*Knyvett*), 1 ♂ ; Darjeeling, 7,500 ft., v-vi.1889 (*A. V. Knyvett*), 1 ♀.

BHUTAN : Buxa, 1 ♀.

Trichopterigia teligera sp. n. (Fig. 52)

♀ 34·5 mm. In structure, shape and pattern near the *decorata* group, though with the fore wing rather elongate, the hind wing relatively ample. Scarcely so thinly scaled as *T. decorata* Moore (1888), but much less attractive, lacking the red subterminal spots ; fore wing more densely irrorate with dark grey and with the black dashes on the veins more numerous and in part, more elongate ; median area broader, the antemedial fascia with a sharp, inward angle before the second submedian vein, the postmedial fascia with two sharp outward projections, one just before the first radial and one just behind the third radial. Hind wing and underside tinged with gray, very feebly marked.

KASHMIR : Narkundah, iv.1888 (*McArthur*), holotype ♀.

Trichopterigia pulcherrima exsanguis subsp. n.

Middle area of fore wing more clearly formed of three bands, a whitish one between two of olive gray ; the central whitish band is suffused with red distally ; the postmedial one is almost unicolorous except for dark vein-streaks with some slight red scaling. Hind wing without noticeable darkening at termen, but this can also fail in *T. p. pulcherrima* Swinhoe (1893).

PHILIPPINE ISLANDS : Luzon, Benguet, Pauai, Haight's Place, 17.xi-8.xii.1912 (*A. E. Wileman*), 2 ♂, 1 ♀, including holotype and allotype.

Trichopterigia decorata (Moore) ab. ***fasciata*** ab. n.

The median area of the fore wing, except for a small patch at the costa, is black-gray.

INDIA : Khasia Hills, 5 ♂, including holotype.

Tatosoma transitaria (Walker) ab. ***semifasciata*** ab. n.

Median area of fore wing from costa to second median vein, except for a small midcostal patch of the ground colour, suffused with fuscous. A recurrent female form, but not common.

NEW ZEALAND : (*Coll. G. Howes*) holotype ♀ ; *ibid.*, (*Coll. W. Colenso*), 1 ♀ ; Greymouth, 1 ♀.

Phthonoloba decussata moltrechti subsp. n.

♂♀ 32-39 mm. Rather larger than the nominate subspecies. Fore wing somewhat clearer green on account of the general weakening of some of the subordinate markings, in particular the band between the sub-basal and antemedial fasciae ; the fascia which divides longitudinally the extra-postmedial pale stripe in the nominate subspecies is obsolescent and the clear green mid-subterminal patch is extended.

FORMOSA : Arizan, *vis-a-vis* Mt. Morrisson, Kagé District, 8,000 ft., vi-vii.1908 (*Moltrecht*), 4 ♂, 7 ♀, including holotype and allotype ; Arizan, viii-ix.1908 (*A. E. Wileman*), 6 ♂, 10 ♀ ; Rantaizan, 7-10.v.1909 (*A. E. Wileman*), 1 ♂, 3 ♀.

Steirophora permista sp. n. (Fig. 54)

♂♀ 37-38 mm. Intermediate in size between *S. fasciata* Moore (1888) and *S. stigmatephora* Prout (1932). The paired tufts or crests on the thorax as sharply black-spotted as in the latter species, the spots of the mesothorax better developed than those of the metathorax. Colouring about as in *fasciata*, shape of markings almost exactly as in *S. altitudinum* Prout (1931), from which it differs chiefly, apart from its colour, in the development of glittering scales on the white fasciae, somewhat as in *stigmatephora* ; subterminal fascia more irregular than in *fasciata*. Hind wing and underside marked about as in *altitudinum* and *S. acrolophites* Prout (1926), but without the strong cinnamon or brownish suffusion shown by *acrolophites*.

PHILIPPINE ISLANDS : Luzon, Benguet, Pauai, Haight's Place, 7,000 ft., 8.xi-10.xii.1912 (*A. E. Wileman*), 1 ♂, 2 ♀ ; *ibid.*, 25.vi.1912, 1 ♀.

Episteira delicata isoepes subsp. n. (Fig. 55)

♂♀ 29-33 mm. Larger than the nominate subspecies, the abdominal process and the colour of the frons perhaps more nearly as in *E. vacuefacta* Prout (1931). The olive gray fasciae of the median area are very uniform, with only an oblique black dash at the hind margin.

CENTRAL CERAM : Manusela, 6,000 ft., x-xii.1919 (*C. F. & J. Pratt*), 1 ♂, 6 ♀, including holotype and allotype.

W. CELEBES : Paloe, G. Rangkoenau, 1,800 ft., xii.1936 (*J. P. A. Kalis*), 1 ♀.

?Episteira carchara sp. n. (Fig. 56)

♀ 33 mm. Similar to *E. eupena* (1936), but the differences are such as betoken a separate species. Palpus slightly longer. Larger and appreciably paler. Vertex whitish. Fore wing with sub-basal fascia straighter ; pale median space broader ; lines of antemedial fascia reduced to a group of three, markedly zig-zag ; distal area as in *eupena*. Hind wing with the stalking of the third radial and first medial veins shorter. Possibly the male will show a relationship with *Tympanota nigrifrons* Warren (1907).

RIU-KIU ISLANDS : 1888 (*H. Pryer coll*), holotype ♀.

Megaloba eucola sp. n. (Fig. 57)

♀ 37·5 mm. Related to *M. postrubidaria* Rothschild (1915) and with a similarly coloured hind wing ; the second discocellular, however, is incurved and there is an appreciable, though only slight, angle at its origin. The narrow bands which bound the principal areas of the fore wing are much darker and better developed than in *postrubidaria*, but there are no white edgings to them ; the antemedial fascia curves inward instead of outward in approaching the second submedian vein.

GOODENOUGH ISLAND : 2,500-4,000 ft., v.1913 (*A. S. Meek*), holotype ♀.

Megaloba loxobasma sp. n. (Fig. 60)

♀ 36 mm. Probably more closely related to *M. admeta* sp. n. than to *M. eucola* and the hind wing shows the typical *Megaloba* neuration, the second discocellular, except for a very short anterior section, strongly oblique outward as far as the origin of the second radial vein, where there is a definite angle. Fore wing with the light bands, which limit the median area, equally broad throughout, except that the antemedial is narrowed slightly at the hind margin, its proximal edge being here even more oblique outward than its distal edge. Hind wing more vinaceous than in either *eucola* or *postrubidaria*.

DUTCH NEW GUINEA : Mt. Goliath, 5-7,000 ft., about 139° longitude, i.1911 (*A. S. Meek*), holotype ♀.

PAPUA : Mt. Tafa, 8,500 ft., iii.1934 (*L. E. Cheesman*), 1 ♀.

Megaloba admeta sp. n. (Fig. 59)

♀ 36-39 mm. Larger than the preceding species and with the cell spot larger than in any other species of *Megaloba* except *M. crypsipyrrha* Prout (1916) ; this spot and the transverse fasciae are not, or scarcely, edged with white ; underside, like the upperside of the hind wing, almost uniformly vinaceous with only some very faint and inconspicuous olive grey suffusion. Venter brightly suffused with vinaceous. Fore wing with the termen only very slightly sinuous ; end of median vein and proximal part of third radial marked with red ; of the dark bands, the one between the sub-basal and the antemedial fasciae is of almost even width and somewhat sinuous ; the ante- and postmedial fasciae much as in *crypsipyrrha*, but with a longer green strip posterior of the central fuscous suffusion that almost unites them ; subterminal lunules more green than white ; terminal black marks at the veins rather elongate.

CENTRAL CERAM : Manusela, 6,000 ft., x-xii.1919 (*C. F. & J. Pratt*), 4 ♀, including holotype.

An exceedingly worn female of this or an extremely close ally from Mindanao is interesting as showing the occurrence of the genus in the Philippine Islands.

Megaloba admeta papuana subsp. n.

Dark markings of fore wing heavy, dark grey mixed with dull red ; sub-basal fascia broadened, the succeeding band scarcely sinuous ; the pale green bands which bound the median area somewhat broadened ; terminal area more darkly suffused. Hind wing : second discocellular with a rather longer oblique tract before the origin of the second radial vein than in the nominate subspecies.

PAPUA : Mt. Tafa, 8,000 ft., iii.1934 (*L. E. Cheesman*), holotype ♀.

Dystypoptila hebes sp. n. (Fig. 58)

♂ 31·5 mm. Fore wing somewhat more elongate than *D. triangularis* Warren (1895), rather brighter green, but with similar pattern. Hind wing also more elongate, very distinct in shape, the apex and tornus being more rounded, the termen between them almost straight, only slightly waved and with a very faint sinus in its posterior half; dark violet grey rather than black, usually becoming more tinged with brown in posterior half.

W. CELEBES: Paloe, G. Rangkoenau, 1,800 ft., xii.1936 (*J. P. A. Kalis*), 1 ♂; Paloe, G. Tompoe, 2,700 ft., i.1937 (*J. P. A. Kalis*), 2 ♂, including holotype; Paloe, Loda, 4,000 ft., v.1937, (*J. P. A. Kalis*), 2 ♂.

Sauris eupitheciata isocraspeda subsp. n. (Fig. 62)

♂ 21-25 mm.; ♀ 25·5-26 mm. Possibly a distinct species, but I can find no structural difference. Larger than the nominate subspecies, especially in the female. Fore wing duller and less variegated, the white parts suffused with drab, a striking contrast to *Sauris eupitheciata viridata* Warren (1907) from New Guinea; cell spot slighter; projection of postmedial fascia somewhat blunter; drab terminal shade unbroken and of equal width throughout.

VULCAN ISLAND: ix.1913-i.1914 (*Meek's Expedition*), 2 ♂, 3 ♀, including holotype and allotype.

Sauris arfakensis catopercna subsp. n.

About the size of *S. a. arfakensis* Joicey & Talbot (1917), the female very similar, but with the subterminal dark maculation obsolescent except between the radial veins and at both margins. The male has the hind wing heavily suffused with dark grey.

CENTRAL BURU: Mrapat, 5,000 ft., iii-iv.1922 (*C. F. & J. Pratt*), 1 ♂, 5 ♀, including holotype and allotype.

Sauris arfakensis seclusa subsp. n.

Hind wing of male more or less suffused or shot with grey, approaching that of *S. arfakensis catopercna*; fore wing with sub-basal fascia more conspicuous than in the nominate subspecies, more noticeably angled and its edges heavily marked with black.

MALAYA: Kedah Peak, 3,200 ft., xii.1915, 1 ♂, 1 ♀; *ibid.*, 3,300 ft., 9-29.iii.1928 (*H. M. Pendlebury*), 3 ♂, 2 ♀, including holotype and allotype.

Sauris patefacta sp. n. (Fig. 63)

♂ 27 mm.; ♀ 28 mm. Wings slightly broader than in *S. arfakensis*, anteriorly less produced. Fore wing with tornus less rounded-off; sub-basal band broader and darker; medial band with a strong, dark fascia preceding the true postmedial, which is itself weaker, chiefly expressed on the veins; subterminal maculation narrowed ; the three pale areas, the antemedial, postmedial and terminal, broadened and almost devoid of markings. Hind wing of the male with the lobe different in shape from that of *arfakensis*, the most distal part more extended and the brightest parts more fawn or vinaceous fawn than yellowish. Palpus in male as in *arfakensis*, in the female almost as in *S. gyiarces* Prout (1932).

MALAYA : Pahang, Fraser's Hill, 4,000 ft., 26-28.i.1929 (*H. M. Pendlebury*), holotype ♂ and allotype ♀.

Sauris olearia sp. n. (Fig. 61)

♂ 34·5 mm. Agrees essentially with *S. patefacta* and *S. gyiarces* in hind wing structure. Palpus scarcely longer than in *arfakensis*, about two and one-half times as long as the diameter of the eye. Fore wing of a deeper green than in either of these species ; hind wing suffused with dark grey in posterior half, paling anteriorly. Underside strongly glossy, a little more deeply tinted and more olivaceous than in *gyiarces*.

SW. CELEBES : G. Lampobattang, Parang-bobo Goa, 5,000 ft., v.1938 (*J. P. A. Kalis*), holotype ♂.

Sauris erecta sententiosa subsp. n.

Differs from *S. e. erecta* Warren (1895) in its darker colouring, with partial suppression of the pale area between the ante- and postmedial fasciae ; antemedial spot on inner margin conspicuously white ; tawny band distad of the postmedial fascia well developed.

CENTRAL CERAM : Manusela, 6,000 ft., x-xii.1919 (*C. F. & J. Pratt*), 2 ♀, including holotype.

Sauris nigrilinearia euneta subsp. n. (Fig. 64)

Differs from *S. n. nigrilinearia* Leech (1897) in the much whiter ground colour of the posterior two-thirds of the fore wing and anteriorly in the apical patch ; the fuscous black pattern being better contrasted, is more conspicuous.

W. CELEBES : Paloe, Loda, 4,000 ft., v.1937 (*J. P. A. Kalis*), holotype ♀.

Sauris ptychosyrma sp. n. (Fig. 66)

♂ 30·5 mm. Larger than *S. nigrifrons* Warren (1907), fore wing without the brownish suffusion in the apical half, anterior angulations of sub-basal and of postmedial fasciae less strong, black fascia along inner margin more extended. Hind wing with cell one-half wing-length, lobe as long as cell with its anterior fold more extended than in *S. erecta* Warren (1895).

W. CELEBES : Paloe, G. Tompoe, 2,700 ft., ii.1937 (*J. P. A. Kalis*), holotype ♂.

Sauris nigrifrons unilinea Prout

Sauris nigrifrons unilinea Prout, 1932, *J. F. M. S. Mus.*, **17** : 76.

The name *unilinea* for the western representatives of *S. nigrifrons* Warren (1907) was very unsatisfactorily published and it was only validated by the indication of the type locality. With a wing span of 29-31 mm., it is generally larger than the nominate subspecies, the markings less sharply defined and the angles of the antemedial fascia less produced.

The holotype female is from Penang and further specimens are known from Sarawak (Poeh Mts.), Borneo (Mt. Kinabalu), Perak, Ceylon and the Khasia Hills.

Sauris basilia sp. n. (Fig. 65)

♀ 33-36 mm. Larger, the type (36 mm.) much larger than any other species of this section of *Sauris* ; even in the absence of the male, the structure and wing pattern of the female demonstrates its generic position. The special feature of the females of this section is the loss of the first median vein of the hind wing ; that this has become coincident with the third radial and not with the second median is proved by such species as *S. imbecilla* Prout (1902). Palpus almost three times as long as the diameter of the eye, strongly suffused with black. Fore wing with the green markings in part grey green, the darker effect being produced partly by a thickening of some of the blackish transverse fasciae ; double pale band between medial band and distal area sharply defined. Hind wing with the stalk of the second subcostal and first radial veins variable, but always short, between one-fourth and one-sixth of their length, nearly always more so than in any of the related forms.

SW. CELEBES : Gunong Lampobattang, Parang-bobo Goa, 5,000 ft., v.1938 (*J. P. A. Kalis*), 3 ♀, including holotype.

Sauris muscosa pleonectes subsp. n. (Fig. 67)

♀ 27·5-32 mm. Larger and a darker green than *S. m. muscosa* Rothschild (1915) ; the transverse fasciae are black rather than brown and, being better contrasted, are more conspicuous ; the subterminal spots between the radial veins and the terminal spots on the veins are strongly developed.

W. CELEBES : Paloe, G. Rangkoenau, 1,800 ft., xii.1936 (*J. P. A. Kalis*), 3 ♀, including holotype ; Paloe, G. Tompoe, 2,700 ft., i-ii.1937 (*J. P. A. Kalis*), 3 ♀ ; Paloe, Lindoe, 3,700 ft., iv.1937 (*J. P. A. Kalis*), 1 ♀.

Sauris inscissa sp. n. (Figs. 68, 69)

♂ 28·5-33 mm.; ♀ 32-33 mm. Termen of fore wing without incision ; termen of male hind wing contorted. Generally larger than *S. proboscidaria* Walker (1862) and *S. usta* Warren (1895). Fore wing greener and much smoother-looking ; the principal transverse fasciae are less strongly dentate than in *proboscidaria*, the subordinate ones faint ; between the antemedial fascia, which is only double at the costa, and the postmedial fascia, consisting of three lines more or less consolidated into a violet grey band ; there is a clear grey stripe, or at least the costal half of such, containing the small cell spot. Hind wing almost as in *usta*, but in the male more unicolorous, the brown shading of the posterior half being obsolescent.

INDIA : Khasia Hills, 5 ♂, 2 ♀, including holotype and allotype ; Cherrapunji, 1 ♂ ; Shillong, 1 ♂ ; Digboi (*L. Brunt*), 1 ♀ ; Darjeeling (*Pilcher*), 1 ♀ ; Cuddapah (Madras), 1 ♀ ; Palni Hills, 1 ♂ ; Nilgiris, 1 ♂, 1 ♀.

BURMA : Hpimaw Fort, 8,000 ft., viii.1923 (*A. E. Swann*), 1 ♂ ; East Pegu, 4-5,000 ft., iii–iv.1890 (*W. Doherty*), 1 ♀.

Sauris othnia sp. n. (Figs. 70, 71)

♂ 30 mm.; ♀ 33 mm. Perhaps a derivative of *S. inscissa* ; closely similar in structure and coloration but with the fore wing curiously reminiscent of *S. abnormis* Moore (1888) in that the violet grey terminal and subterminal bands have exactly the same development. Principal transverse fasciae, especially in the holotype male, still less bent than in *inscissa* ; the allotype female is slightly broader-winged than the female *inscissa*.

BATCHIAN : iii.1892 (*W. Doherty*) holotype ♂ and allotype ♀ ; *ibid.*, 1897, 1 ♀.

Sauris usta (Warren) ab. ***stictifascia*** ab. n.

This, the only banded form that *usta* seems to produce, has the three lines of the postmedial fascia fused into a narrow, dark band.

MALAYA : Bukit Kutu, 3,500 ft., 14.iv.1926 (*H. M. Pendlebury*), 1 ♂ ; *ibid.*, 3,300 ft., 30.ix.1932, holotype ♂.

Sauris usta asema subsp. n.

Fore wing rather narrower, much more uniformly grey green and without the reddish brown markings. Hind wing also with the two colours less sharply differentiated.

E. JAVA : Nongkodjadjar, 4,000 ft., ix.1933 (*A. M. R. Wegner*), holotype ♂.

Sauris oetakwana sp. n. (Fig. 72)

♂♀ 30 mm. Represents the *usta* group in New Guinea. Shape and colour of fore wing nearly as in *S. poeciloteucta* Prout (1932), the markings at least as weak as in *usta*, the dark subterminal mark at the second median not so obliquely curved. Hind wing of male with the posterior part coloured as in *usta*, the anterior part less whitened, the fringe infuscated both anterior and posterior of the prominence and the tufts on the underside of this wing rather stronger.

DUTCH NEW GUINEA : Snow Mts., near Oetakwa R., up to 3,500 ft., x-xii.1910 (*A. S. Meek*) 3 ♂, 1 ♀, including holotype and allotype.

EXPLANATION OF FIGURES

Fig. 1. *Ziridava xylinaria baliensis* subsp. n., holotype ♂, 16 mm.
Fig. 2. *Z. x. khasiensis* subsp. n., paratype ♂, 13·5 mm.
Fig. 3. *Z. x. kanshireiensis* subsp. n., holotype ♂, 13·5 mm.
Fig. 4. *Z. asterota* sp. n., holotype ♂, 13·5 mm.
Fig. 5. *Calluga grammophora* sp. n., holotype ♂, 8·5 mm.
Fig. 6. *Gymnoscelis expedita* sp. n., holotype ♀, 8·5 mm.
Fig. 7. *G. ammocyma* sp. n., holotype ♀, 7 mm.
Fig. 8. *G. poecilimon* sp. n., paratype ♂, 10 mm.
Fig. 9. *G. holoprasia* sp. n., holotype ♂, 8 mm.
Fig. 10. *G. protracta* sp. n., holotype ♂, 9 mm.
Fig. 11. *G. pyrissous* sp. n., holotype ♂, 9 mm.
Fig. 12. *G. anaxia* sp. n., holotype ♂, 9 mm.

Fig. 13. *Gymnoscelis argyropasta* sp. n., paratype ♀, 9·5 mm.
Fig. 14. *G. lavella* sp. n., holotype ♀, 8 mm.
Fig. 15. *G. distatica* sp. n., allotype ♀, 10 mm.
Fig. 16. *G. phoenicopus* sp. n., holotype ♀, 10·5 mm.
Fig. 17. *G. erymna nephelota* subsp. n., holotype ♀, 8·5 mm.
Fig. 18. *G. mesophoena taprobanica* subsp. n., paratype ♀, 7·5 mm.
Fig. 19. *G. oblenita* sp. n., holotype ♂, 7·5 mm.
Fig. 20. *G. conjurata* sp. n., holotype ♂, 9 mm.
Fig. 21. *G. latipennis* sp. n., paratype ♂, 8·5 mm.
Fig. 22. *Onagrodes oosyndica* sp. n., allotype ♀, 12 mm.
Fig. 23. *O. oosyndica* sp. n., holotype ♂, 11 mm.
Fig. 24. *O. obscurata* Warren, paratype ♂, 10 mm.

Fig. 25. *Onagrodes victoria* sp. n., holotype ♂, 10 mm.
Fig. 26. *O. eucineta* sp. n., holotype ♂, 10·5 mm.
Fig. 27. *Pseudomimetis vailima* sp. n., holotype ♀, 8 mm.
Fig. 28. *Hybridoneura truncata* sp. n., holotype ♂, 9 mm.
Fig. 29. *H. metachlora lativitra* subsp. n., holotype ♂, 8·5 mm.
Fig. 30. *Antimimistis cuprina* sp. n., holotype ♂, 13 mm.
Fig. 31. *Brabira operosa* sp. n., holotype ♂, 13·5 mm.
Fig. 32. *Heterophleps heinrichi* sp. n., holotype ♂, 13 mm.
Fig. 33. *H. parapasta* sp. n., holotype ♂, 15 mm.
Fig. 34. *Cryptoloba metorchatica* sp. n., holotype ♀, 16 mm.
Fig. 35. *C. mesta* sp. n., holotype ♂, 15·5 mm.
Fig. 36. *C. peperitis* sp. n., holotype ♂, 15·5 mm.

Fig. 37. *Chrioloba andrewesi* sp. n., holotype ♀, 10·5 mm.
Fig. 38. *Goniopteroloba biconcava* sp. n., holotype ♂, 12 mm.
Fig. 39. *G. pallida pangeanensis* subsp. n., paratype ♂, 10 mm.
Fig. 40. *Chrioloba o. ochraceistriga* sp. n., holotype ♂, 9 mm.
Fig. 41. *C. o. sectilinea* subsp. n., holotype ♂, 9·5 mm.
Fig. 42. *Nothocasis octobris* sp. n., holotype ♂, 18 mm.
Fig. 43. *Trichopteryx polystictaria tsangpoensis* subsp. n., holotype ♂, 18·5 mm.
Fig. 44. *T. knyvetti* sp. n., holotype ♂, 18 mm.
Fig. 45. *Trichopterigia dejeani* sp. n., paratype ♀, 18·5 mm.
Fig. 46. *T. rufinotata illumina* subsp. n., holotype ♂, 18·5 mm.
Fig. 47. *T. rubripuncta miantosticta* subsp. n., holotype ♂, 16·5 mm.
Fig. 48. *T. pilcheri* sp. n., holotype ♀, 19 mm.

Fig. 49. *Trichopterigia rivularis acidnias* subsp. n., paratype ♂, 16 mm.
Fig. 50. *T. hagna* sp. n., holotype ♂, 18 mm.
Fig. 51. *T. adiopa* sp. n., paratype ♀, 17 mm.
Fig. 52. *T. teligera* sp. n., holotype ♀, 16·5 mm.
Fig. 53. *T. micradelpha* sp. n., paratype ♀, 13·5 mm.
Fig. 54. *Steirophora permista* sp. n., paratype ♀, 18 mm.
Fig. 55. *Episteira delicata isoepes* subsp. n., paratype ♀, 13·5 mm.
Fig. 56. ? *Episteira carchara* sp. n., holotype ♀, 15·5 mm.
Fig. 57. *Megaloba eucola* sp. n., holotype ♀, 16 mm.
Fig. 58. *Dystypoptila hebes* sp. n., holotype ♂, 14 mm.
Fig. 59. *Megaloba admeta* sp. n., paratype ♀, 17 mm.
Fig. 60. *M. loxobasma* sp. n., holotype ♀, 16·5 mm.

Fig. 61. *Sauris olearia* sp. n., holotype ♂, 16·5 mm.
Fig. 62. *S. eupitheciata isocraspeda* subsp. n., paratype ♀, 12 mm.
Fig. 63. *S. patefacta* sp. n., holotype ♂, 13 mm.
Fig. 64. *S. nigrilinearia euneta* subsp. n., holotype ♀, 15 mm.
Fig. 65. *S. basilia* sp. n., holotype ♀, 17 mm.
Fig. 66. *S. ptychosyrma* sp. n., holotype ♂, 11 mm.
Fig. 67. *S. muscosa pleonectes* subsp. n., holotype ♀, 15 mm.
Fig. 68. *S. inscissa* sp. n., allotype ♀, 15 mm.
Fig. 69. *S. inscissa* sp. n., holotype ♂, 16·5 mm.
Fig. 70. *S. othnia* sp. n., holotype ♂, 14 mm.
Fig. 71. *S. othnia* sp. n., allotype ♀, 15·5 mm.
Fig. 72. *S. oetakwana* sp. n., paratype ♂, 14 mm.

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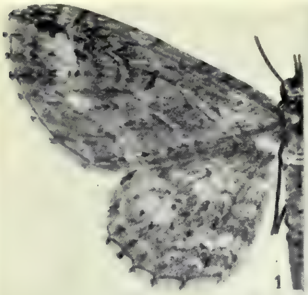
NATURAL HISTORY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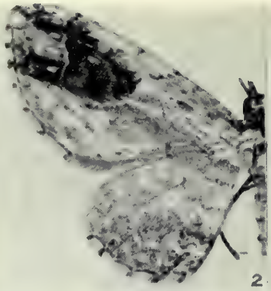
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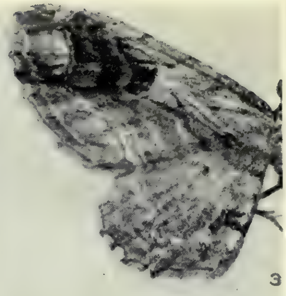
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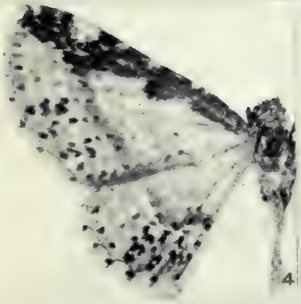
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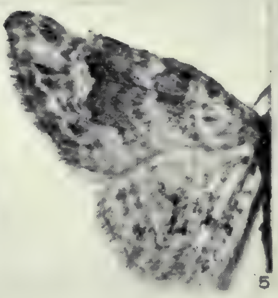
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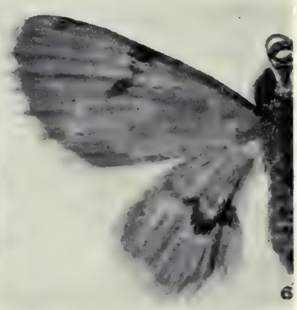
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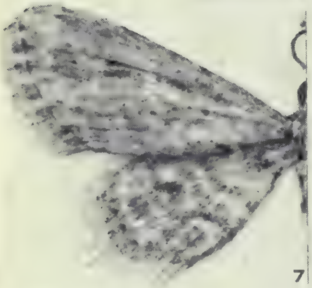
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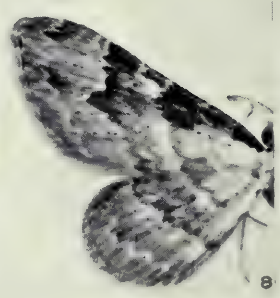
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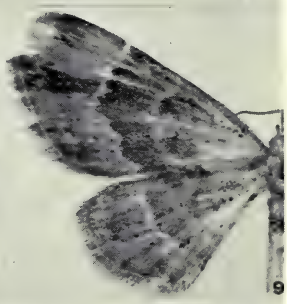
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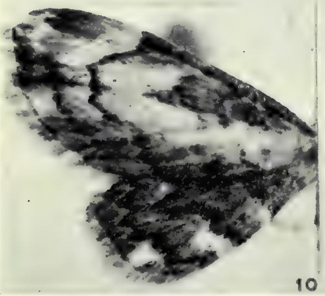
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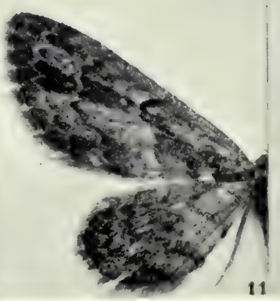
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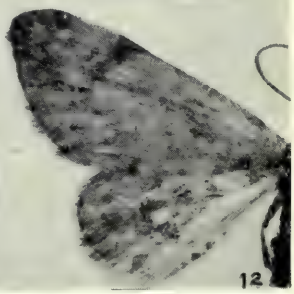
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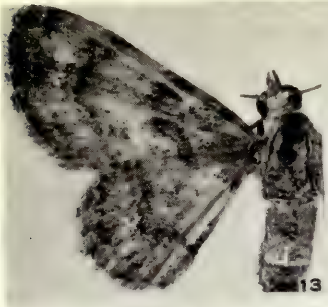
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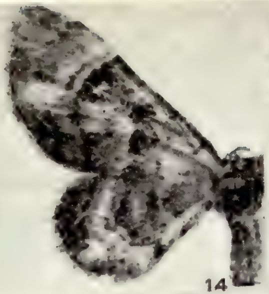
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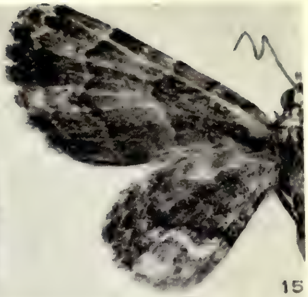
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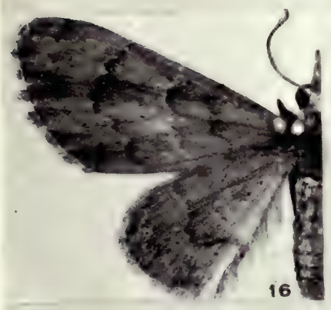
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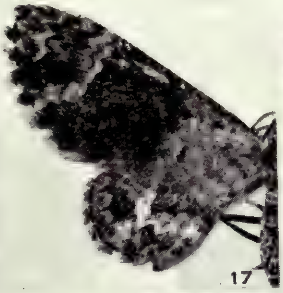
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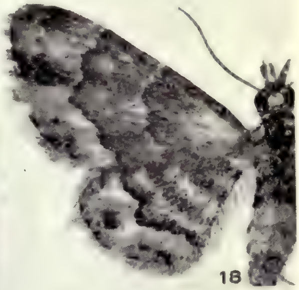
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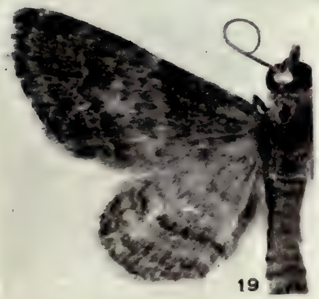
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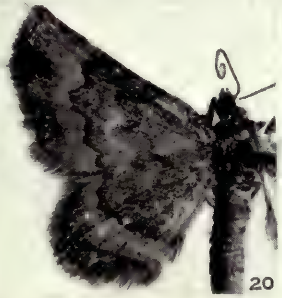
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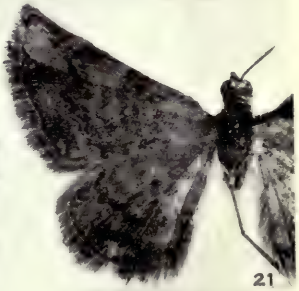
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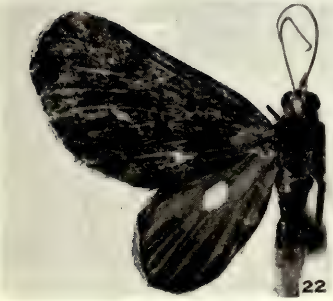
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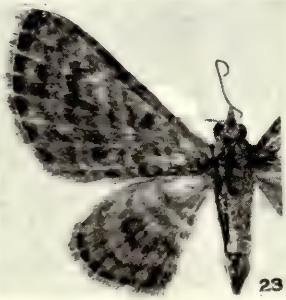
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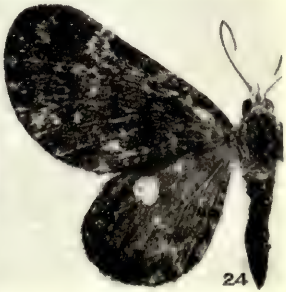
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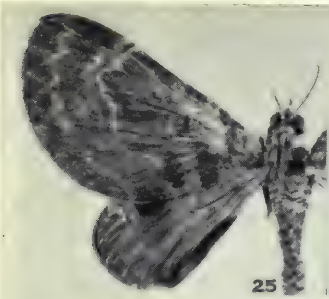
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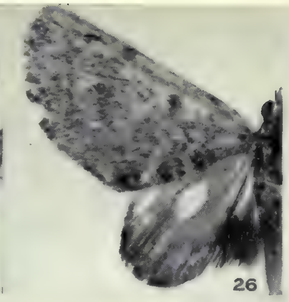
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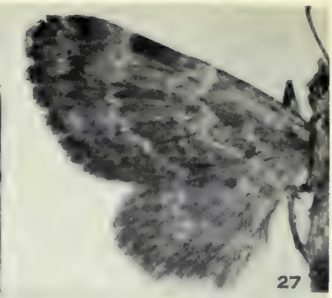
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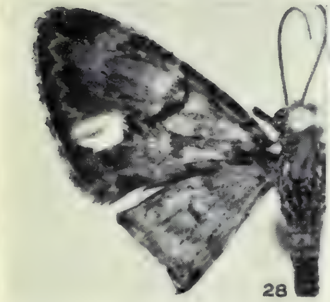
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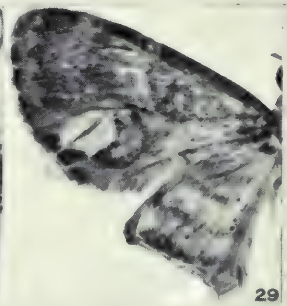
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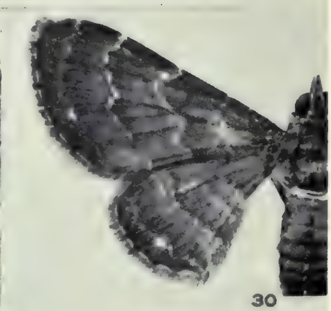
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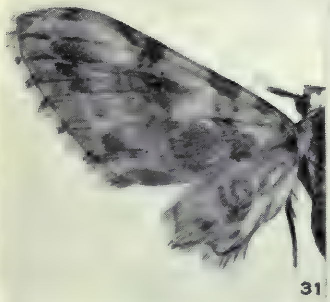
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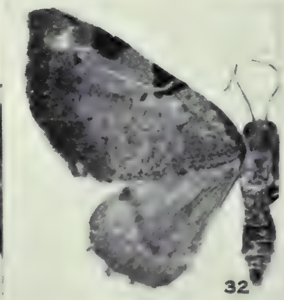
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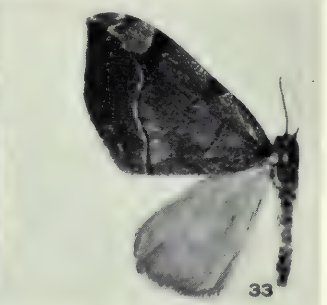
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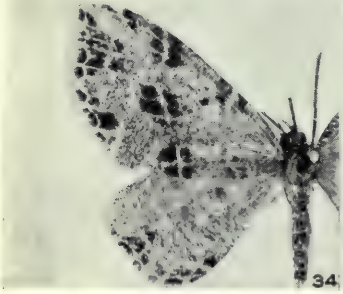
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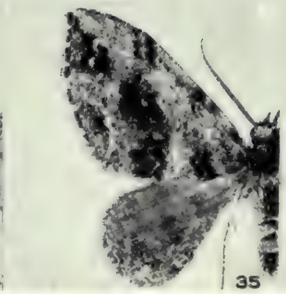
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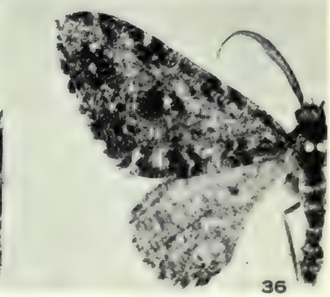
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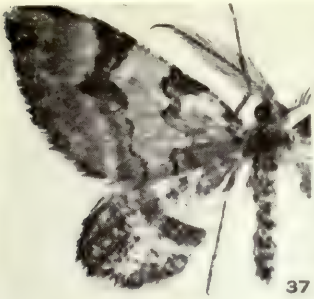
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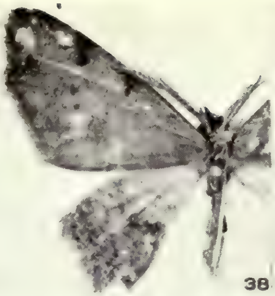
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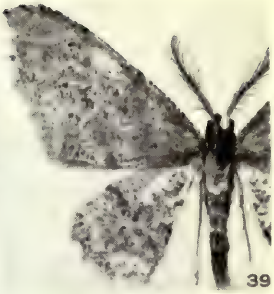
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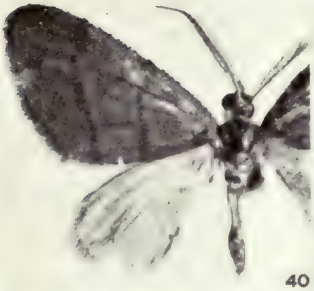
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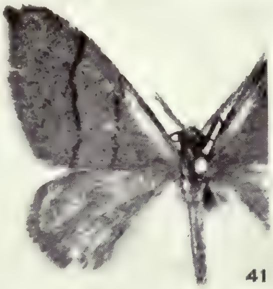
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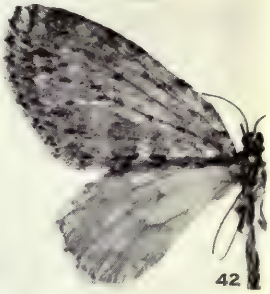
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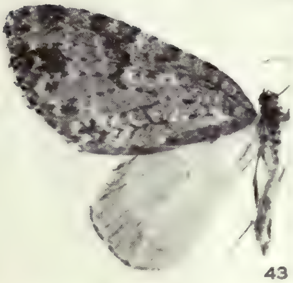
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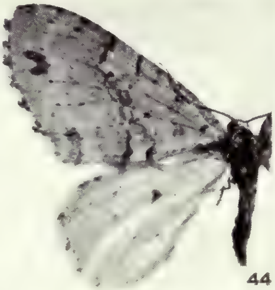
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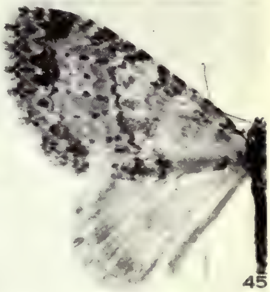
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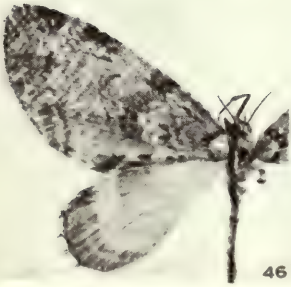
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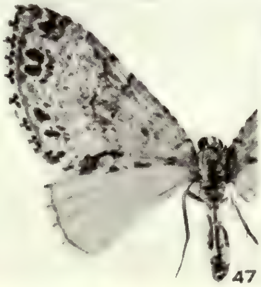
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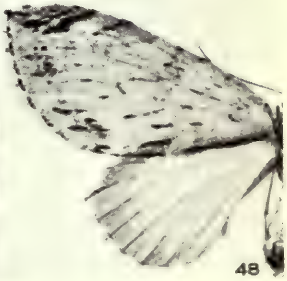
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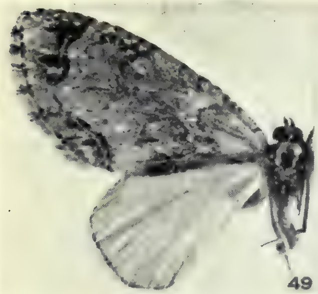
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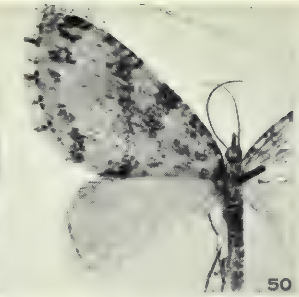
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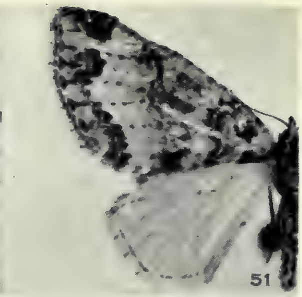
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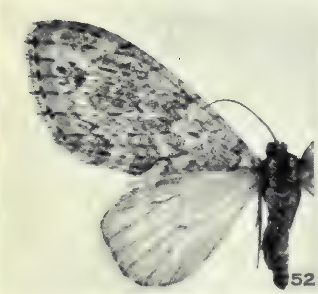
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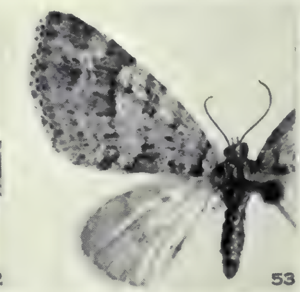
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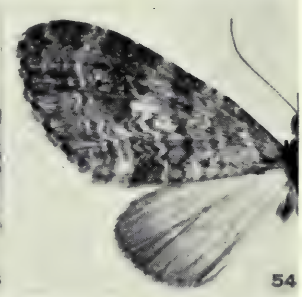
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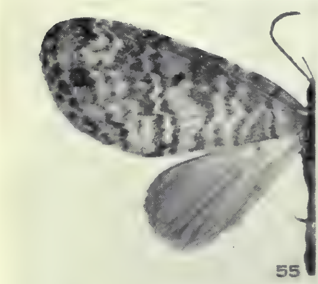
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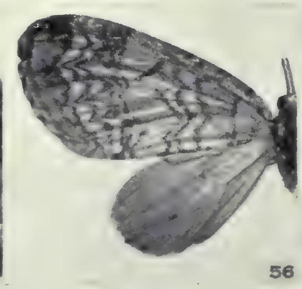
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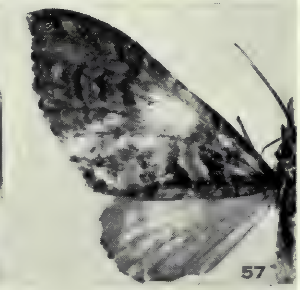
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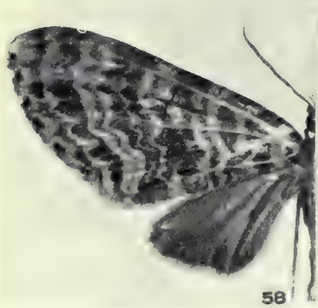
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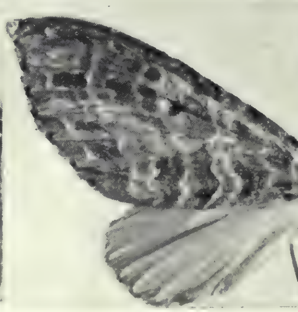
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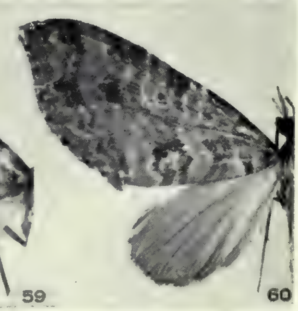
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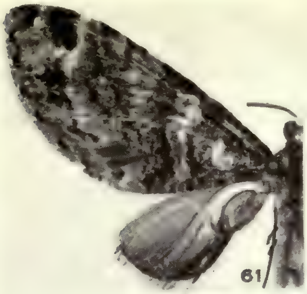
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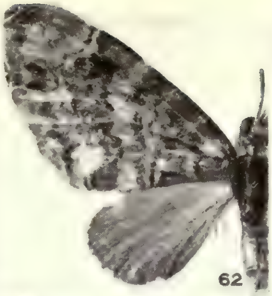
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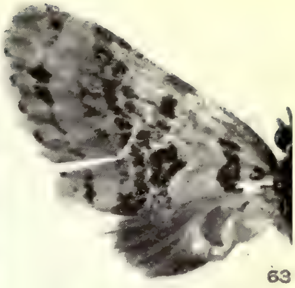
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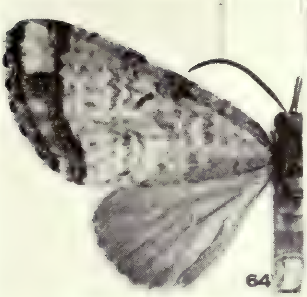
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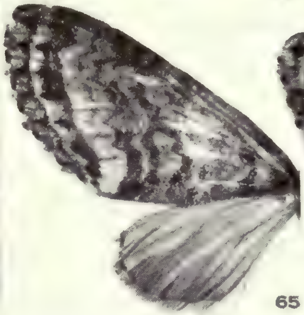
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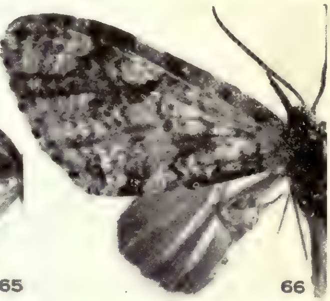
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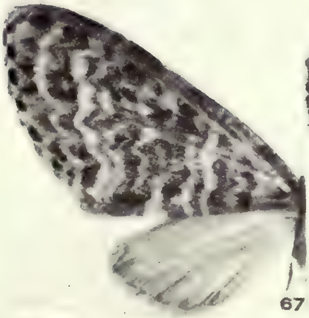
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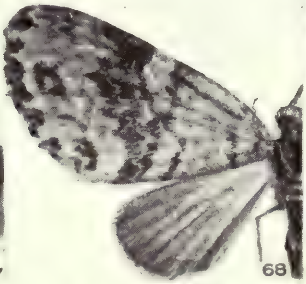
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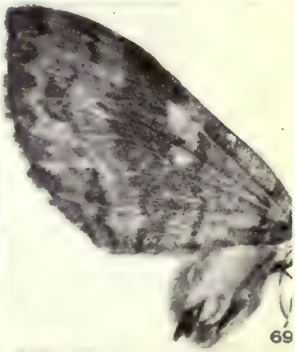
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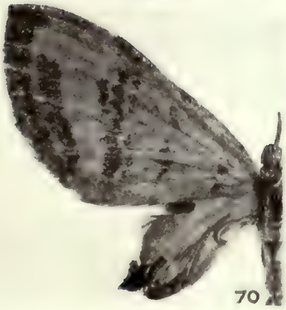
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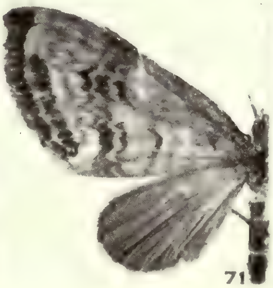
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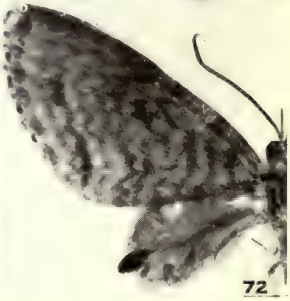
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